

Central Facilities Area Landfills I, II, and III Annual Monitoring Report – 2005

August 2006

**Idaho
Cleanup
Project**

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Central Facilities Area Landfills I, II, and III Annual Monitoring Report – 2005

August 2006

**Idaho Cleanup Project
Idaho Falls, Idaho 83415**

Prepared for the
U.S. Department of Energy
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ABSTRACT

This report summarizes the 2005 monitoring data collected for Landfills I, II, and III at the Central Facilities Area (CFA) of the Idaho National Laboratory. Landfill monitoring is conducted to ensure that the environmental remedy selected under the *Record of Decision Declaration for Central Facilities Area Landfills I, II, and III (Operable Unit 4-12) and No Action Sites (Operable Unit 4-03)* is operating as designed.

Groundwater, soil-gas, and soil-moisture data were collected and analyzed. Groundwater monitoring consisted of sampling nine wells for volatile organic compounds, metals, and anions. One well at Landfill III and three wells at Landfill II did not contain enough water to sample. Soil-gas monitoring consisted of collecting samples from five borehole locations with four depths sampled at each location and two sampling intervals from two newly completed monitoring wells for a total of 24 samples. Soil-moisture monitoring consisted of gathering neutron-probe data from five locations and time-domain reflectometry (TDR) data from four deep-profile locations.

The June 2005 water-level map for the CFA indicates a local groundwater flow direction of southeast for Landfill II and south to southwest for Landfills I and III. The groundwater flow directions and gradients are consistent with past measurements. Two additional monitoring wells were installed and sampled to ensure that the current groundwater-monitoring system at the landfills provides enough coverage to ensure that the groundwater samples represent groundwater quality downgradient of the landfills.

The groundwater data indicated that nitrate and chromium were the only analytes detected above a U.S. Environmental Protection Agency maximum contaminant level. Nitrate was detected above its maximum contaminant level of 10 mg/L in Wells CFA-MON-A-002 (17.9 mg/L-N) and CFA-MON-A-003 (24 mg/L-N). Except for the current spike in CFA-MON-A-003, nitrate concentrations in CFA-MON-A-002 and -003 have remained relatively steady since monitoring began in 1995.

Chromium was detected above its maximum contaminant level of 100 µg/L in one sample from Well LF3-09. The cause of the elevated chromium concentration is uncertain, but it could be due to suspended particulates.

The soil-gas monitoring showed that most analytes were within their historical ranges. The primary soil-gas contaminants—chlorinated solvents, their degradation products, and freons—were not detected in groundwater and, therefore, do not appear to be affecting it. The compound occurring at the highest concentration was trifluorochloromethane at 6,200 ppbv. In most previous years, 1,1,1-trichloroethane occurred at the highest concentration in soil gas samples. In 2005, the highest 1,1,1-trichloroethane concentration was 4,700 parts per billion by volume (ppbv) in GSP3-2 at a nominal depth of 107.5 ft. Other compounds occurring at concentrations above 2,000 ppbv include 1,1-dichloroethane, 1,1-dichloroethene, cis-1,2-dichloroethene, and dichlorodifluoromethane.

The soil-moisture monitoring at Landfills II and III indicated low recharge (less than 0.7 in.) at the two TDR locations on Landfill II and no recharge at the two TDR locations on Landfill III. Because of problems with the neutron probe, recharge was not calculated for the five neutron probe access tube (NAT) locations.

Landfill cover modeling was performed to quantify long-term recharge rates through the landfill covers and compare cover results to a background location to evaluate the effectiveness of the covers in reducing recharge. This was accomplished by simulating infiltration patterns with a one-dimensional vadose zone model and calibrating the model to transient observed soil moisture. Modeling studies used NAT data from Stations LF3-05 (Landfill III), LF2-04 (background) and LF2-07 (Landfill II).

At LF3-05, seasonal infiltration pulses were effectively removed by subsequent evaporation. Water content variations were more rapidly damped with depth, as compared to the NAT locations simulated for Landfill II.

Calculated average recharge rates at LF2-04 and LF2-07 were approximately 7 and 3 cm per year, respectively. Although greater than at LF3-05, the simulated recharge at LF2-07 is less than half that at LF2-04 (the background location between the landfills). The reduction in recharge at LF2-07, as compared to the background location suggests that the cover on Landfill II significantly enhances evapotranspiration over natural conditions.

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ACRONYMS

amsl	above mean sea level
bbc	below brass cap
bls	below land surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFA	Central Facilities Area
CFR	<i>Code of Federal Regulations</i>
DOE	U.S. Department of Energy
EBTF	Experimental Barrier Testing Facility
EPA	U.S. Environmental Protection Agency
ET	evapotranspiration
FFA/CO	Federal Facility Agreement and Consent Order
INL	Idaho National Laboratory
INTEC	Idaho Nuclear Technology and Engineering Center
MCL	maximum contaminant level
NAT	neutron-probe access tube
NOAA	National Oceanic and Atmospheric Administration
NS	not sampled
OH	open hole
OU	operable unit
PCE	tetrachloroethene
PE	potential evaporation
PET	potential evapotranspiration
ppbv	parts per billion by volume
ppmv	parts per million by volume
PRG	preliminary remediation goal
PT	potential transpiration
ROD	record of decision
SAB	Spreading Area B
SDA	Subsurface Disposal Area
SMCL	secondary maximum contaminant level

SRPA	Snake River Plain Aquifer
STF	Security Training Facility
TCE	trichloroethene
TDR	time-domain reflectometry
USC	<i>United States Code</i>
VOC	volatile organic compound
WAG	waste area group

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1. INTRODUCTION AND PURPOSE

This report presents the results of monitoring conducted to ascertain the effectiveness of the remedial action at Landfills I, II, and III located at the Central Facilities Area (CFA) of the Idaho National Laboratory (INL) Site (see Figure 1-1). These results are from groundwater and soil-gas monitoring conducted during 2005 and soil-moisture monitoring conducted from October 2004 to October 2005.

This monitoring supports the *Record of Decision Declaration for Central Facilities Area Landfills I, II, and III (Operable Unit 4-12) and No Action Sites (Operable Unit 4-03)* (DOE-ID 1995), which designates “containment” as the environmental remedy for the CFA landfills. In addition, the groundwater monitoring, in particular the monitoring of nitrate, supports the *Final Comprehensive Record of Decision for the Central Facilities Area Operable Unit 4-13* (DOE-ID 2000a). Previous monitoring results are reported in the *Central Facilities Area Landfills I, II, and III Five-Year Review Supporting Documentation* (DOE-ID 2002a) and the CFA Landfills Annual Monitoring Reports for 2002 (INEEL 2003a), 2003 (ICP 2004) and 2004 (ICP 2005). This report does not address institutional controls and land-use restrictions.

Post-remedial action monitoring required by the Operable Unit (OU) 4-12 Record of Decision (ROD) (DOE-ID 1995) is being carried out in accordance with the *Post Record of Decision Monitoring Work Plan Central Facilities Area Landfills I, II, and III Operable Unit 4-12* (INEEL 2003b) and the *Field Sampling Plan for the Post Record of Decision Monitoring Central Facilities Area Landfills I, II, and III Operable Unit 4-12* (INEEL 2005). The results of the remedial action are summarized in the *Remedial Action Report CFA Landfills I, II, and III Native Soil Cover Project Operable Unit 4-12* (DOE-ID 1997).

1.1 Regulatory Background

The *Federal Facility Agreement and Consent Order for the Idaho National Engineering Laboratory* and its associated action plan (DOE-ID 1991) were negotiated and signed by the U.S. Department of Energy (DOE) Idaho Operations Office, the U.S. Environmental Protection Agency (EPA), and the Idaho Department of Health and Welfare (hereinafter collectively referred to as the Agencies) in December 1991 to implement remediation of the INL under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (42 USC § 9601 et seq.). The goals of the Federal Facility Agreement and Consent Order (FFA/CO) are to ensure that: (a) potential or actual INL releases of contaminants to the environment are thoroughly investigated in accordance with the “National Oil and Hazardous Substances Pollution Contingency Plan” (40 CFR 300) and (b) appropriate response actions are taken to protect human health and the environment.

The FFA/CO established the procedural framework and schedule for developing, prioritizing, implementing, and monitoring response actions at INL in accordance with CERCLA, the Resource Conservation and Recovery Act (42 USC § 6901 et seq.), and the Idaho Hazardous Waste Management Act (Idaho Code § 39-4401 et seq.). The FFA/CO is consistent with the general approach approved by EPA and DOE, where agreements with states as full partners would allow site investigation and cleanup to proceed using a uniform set of regulations for all states in order to minimize conflicting requirements and maximize limited remediation resources. For management purposes, the FFA/CO divided the INL into 10 waste area groups (WAGs).

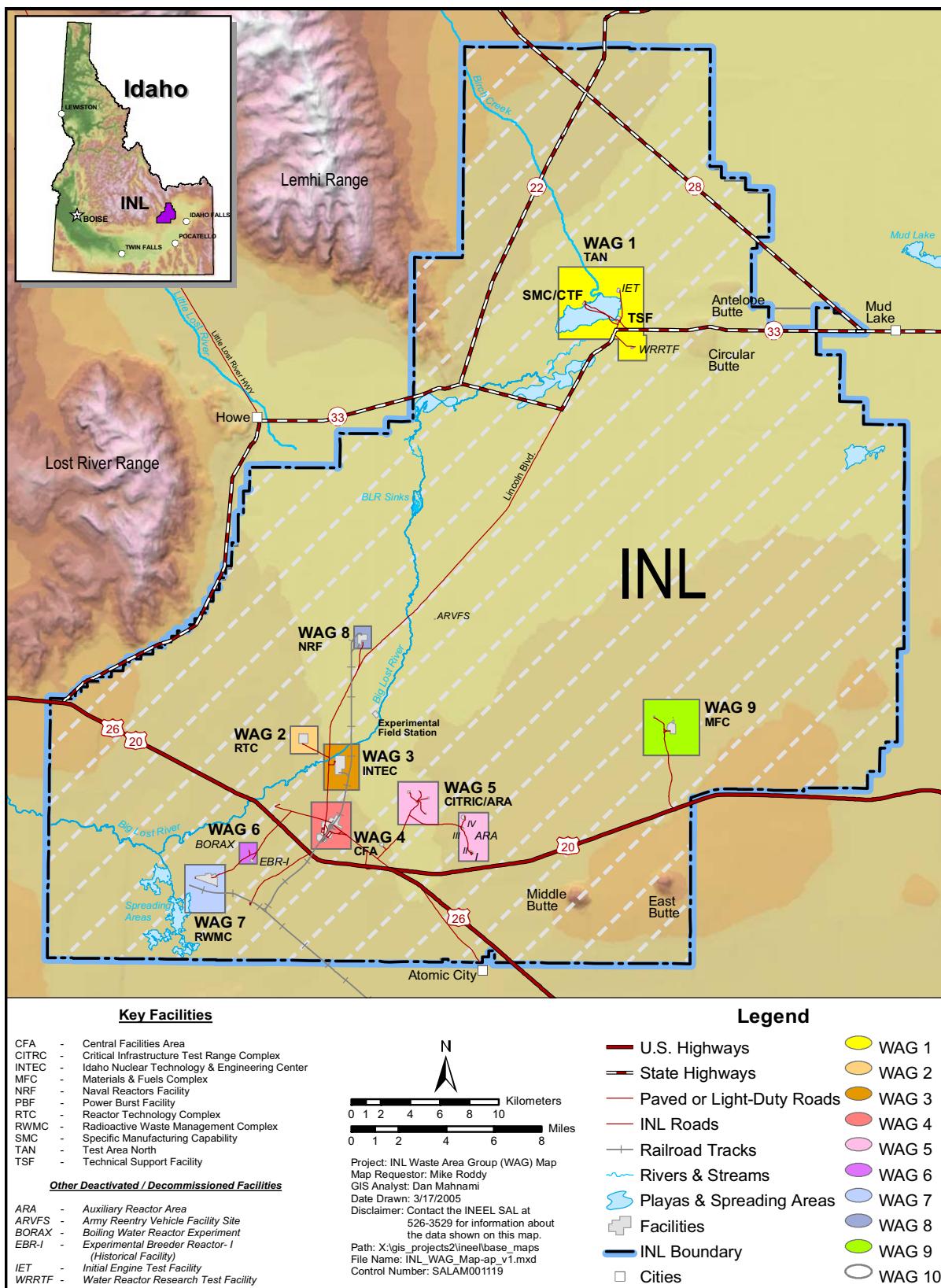


Figure 1-1. Location of the Central Facilities Area (Waste Area Group 4) at the Idaho National Laboratory Site.

The CFA, designated as WAG 4, incorporated 13 OUs originally containing a total of 44 individual release sites. After publication of the FFA/CO, eight additional sites were formally assigned to OUs within WAG 4. In total, 52 sites are incorporated in the *Comprehensive Remedial Investigation/Feasibility Study for the Central Facilities Area Operable Unit 4-13 at the Idaho National Engineering and Environmental Laboratory* (DOE-ID 2000b). Operable Unit 4-12 consisted of the three inactive CFA landfills. The OU 4-12 ROD (DOE-ID 1995) documented that the risk associated with the CFA landfills was found to be within the generally accepted limits of CERCLA or Superfund (i.e., the risk assessment indicated that the landfills do not pose an unacceptable threat to human health and the environment). As is typical for landfills, uncertainty about the waste disposal history resulted in uncertainty about future risk, particularly as it relates to the potential for contaminant migration through leaching and cover erosion. Therefore, containment—a remedial action consistent with the EPA's presumptive remedy guidance for CERCLA municipal landfills—was warranted for the CFA landfills.

The requirement for monitoring the landfills was established in the OU 4-12 ROD (DOE-ID 1995). The remedial design, as delineated in the *Remedial Design/Remedial Action Work Plan for Central Facilities Area Landfills I, II, and III Native Soil Cover Project Operable Unit 4-12* (DOE-ID 1996), specified the manner in which monitoring of groundwater, cover infiltration, and the vadose zone would be carried out. The Post-ROD Monitoring Work Plan (INEEL 2003b) was designed to provide data for use in evaluating whether the remedial action objectives stated in the ROD are being met.

1.2 Physical Characteristics

The CFA landfills are located on the Eastern Snake River Plain in Big Lost River alluvial deposits overlying basalt bedrock. The sediments composing these deposits are primarily sands and gravels and contain very few fine-grained materials. In some places, however, a clay-rich layer up to 9 ft thick exists above the bedrock (Ansley, Hull, and Burns 1988). The depth to basalt at these landfills ranges from 10 to 37 ft.

The vadose zone—the portion of the subsurface extending from the land surface to the water table—at the CFA landfills is approximately 480 ft thick. The vadose zone is composed of a relatively thin layer of surface sediments (where wastes were disposed of) and thick sequences of interfingered basalt flows that contain interbedded sediments. The vadose zone soils near the landfills tend to be relatively dry during most of the year because of the relatively low annual precipitation, high potential evapotranspiration (ET), and deep water table. The spring snowmelt is the greatest source of water available for infiltration to the landfills. If enough moisture is present to saturate or nearly saturate the soil in a short period, then moisture may quickly drain into the deeper vadose zone. The Snake River Plain Aquifer (SRPA), one of the largest and most productive groundwater resources in the United States, underlies the CFA landfills. The SRPA is listed as a Class I aquifer, and the EPA has designated it as a sole-source aquifer. The SRPA consists of a series of saturated basalt flows and interlayered pyroclastic and sedimentary materials that underlie the Eastern Snake River Plain.

1.2.1 CFA Landfill I

CFA Landfill I occupies a total surface area of approximately 8.25 acres and consists of three subunits: the rubble landfill, western waste trench, and northern waste trench (Figure 1-2). The rubble landfill originated as a gravel quarry that was operated by the U.S. Navy from 1942 to 1949. The quarry was used as a disposal area for Sitewide waste sometime after 1949. Wastes were discarded in the landfill from the 1950s to 1984. The surface area of the rubble landfill is estimated to be 5.5 acres, and its depth is estimated to be 12 to 15 ft. Before a new cover was installed, the rubble landfill was covered with approximately 1 to 5 ft of soil overlain with a layer of gravel.

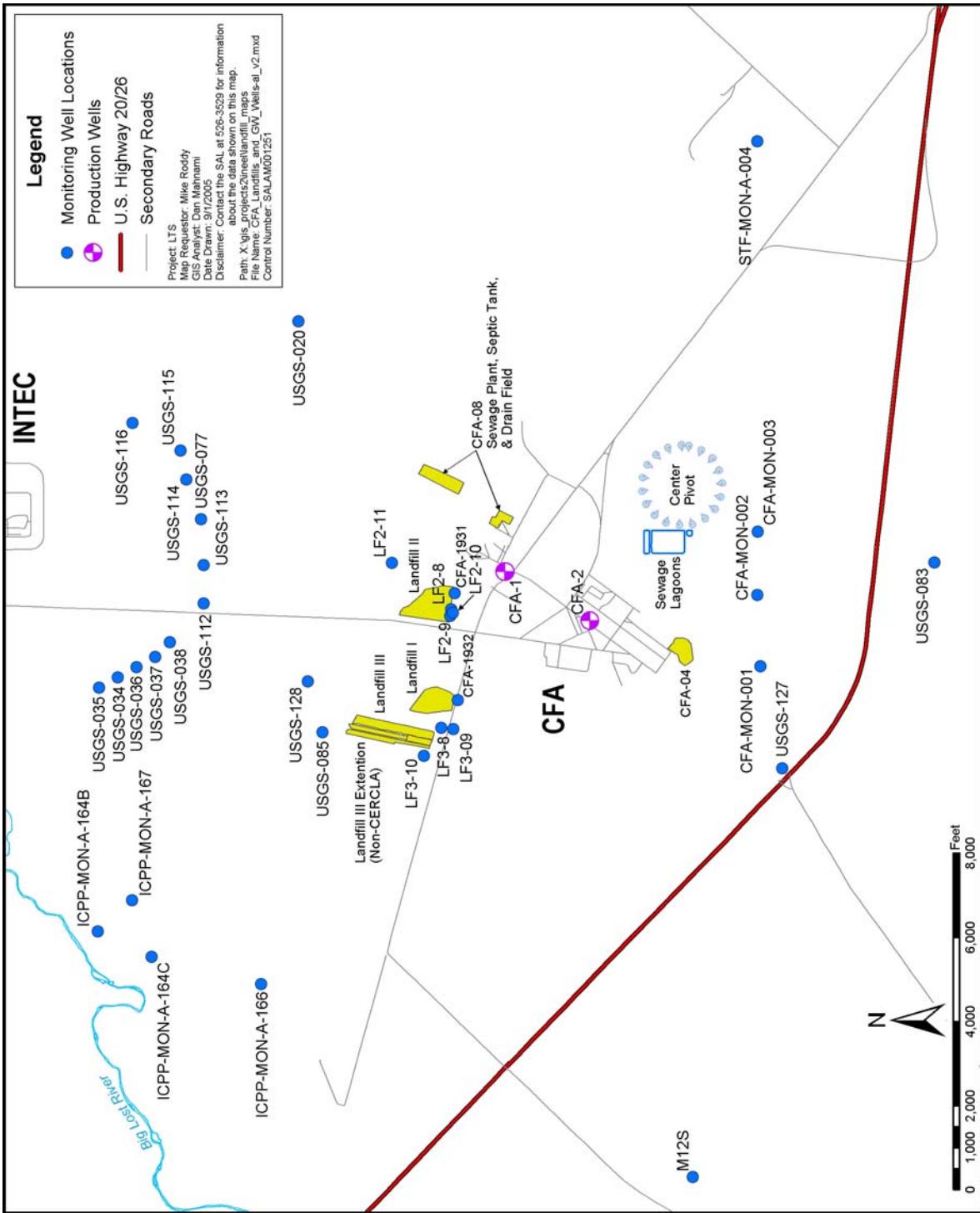


Figure 1-2. Locations of Central Facilities Area landfills and groundwater monitoring wells.

The surface area of the western waste trench is approximately 2 acres and consists of smaller waste trenches, each excavated to a size of 8 ft wide × 50 ft long × 10 ft deep. The western waste trench is west of the present-day road separating Landfills I and III and is actually covered by the Landfill III cap. Each of the smaller trenches is separated from the other by 15 ft of undisturbed soil. Filled trenches were covered with 1 to 5 ft of soil. The northern waste trench was identified from aerial photographs and has a surface area of approximately 0.75 acre.

1.2.2 CFA Landfill II

CFA Landfill II encompasses approximately 15 acres and is located in the southwest corner of an abandoned gravel pit (Figure 1-2). It received waste from September 1970 until it was closed in September 1982. Depth to basalt at this landfill varies from 15 to 37 ft based on a seismic refraction survey and a subsurface borehole drilling investigation. However, the landfill waste profile is estimated to range in depth from 12 to 28 ft, because the pit probably was not excavated beyond the base of the gravel-bearing unit and into the clay material. Hand augering at 60 sampling sites indicated the original CFA Landfill II soil cover ranged in thickness from 0.33 to 3.17 ft, with an overall mean of 1.5 ft. Before installation of the new cover, the landfill surface was gently undulating (due to differential settling of the waste) and covered with a stand of crested wheatgrass.

1.2.3 CFA Landfill III

CFA Landfill III consists of six trenches that cover approximately 12 acres (Figure 1-2). It opened in October 1982, after CFA Landfill II was closed, and operated until December 1984. Depth to the underlying basalt is 10 to 33 ft based on a seismic refraction survey. The landfill waste profile is estimated to be 13 ft deep on average. It was common practice to excavate the landfill trenches, leaving a soil layer intact between the waste and underlying basalt. The original CFA Landfill III soil cover ranged in thickness from 1 to 8 ft, with an overall mean of 2.83 ft, based on augering results. Ground-penetrating radar measurements estimate the average original soil cover thickness to be 2 to 3 ft. Before installation of the new cover, the landfill surface was gently undulating (due to differential settling of the waste) and covered with a stand of crested wheatgrass.

1.3 Description of Remedial Action

Based on CERCLA requirements, the detailed analysis of alternatives, and public comments, the Agencies selected uniform containment with a native soil cover, institutional controls, and monitoring as the most appropriate environmental remedy for the CFA landfills. Containment with a native soil cover is believed to be the best alternative for minimizing public risk and providing long-term protection of the SRPA. The prefinal inspection for the CFA landfills I, II, and III native soil cover project was conducted on December 13, 1996, and was performed by representatives of DOE, EPA, Idaho Department of Health and Welfare, the Maintenance and Operations Contractor for the INL Site (at that time), and Parsons. Outstanding items identified during the inspection on December 13, 1996, were corrected in April 1997 (DOE-ID 1997).

The major components of the remedy included: (a) placing a uniform native soil cover over Landfills I, II, and III; (b) implementing institutional controls; and (c) periodic monitoring of groundwater, infiltration, and the vadose zone.

The native soil cover consisted of three layers: (a) a general backfill layer that brought the existing grade up to the design slope (rough grade), (b) a compacted low-permeability soil layer (approximately 12 in. thick), and (c) a topsoil layer (approximately 6 in. thick) that created the final grade and allows for growth of a vegetative cover (Figure 1-3). To install the cover over each landfill, the landfill was initially

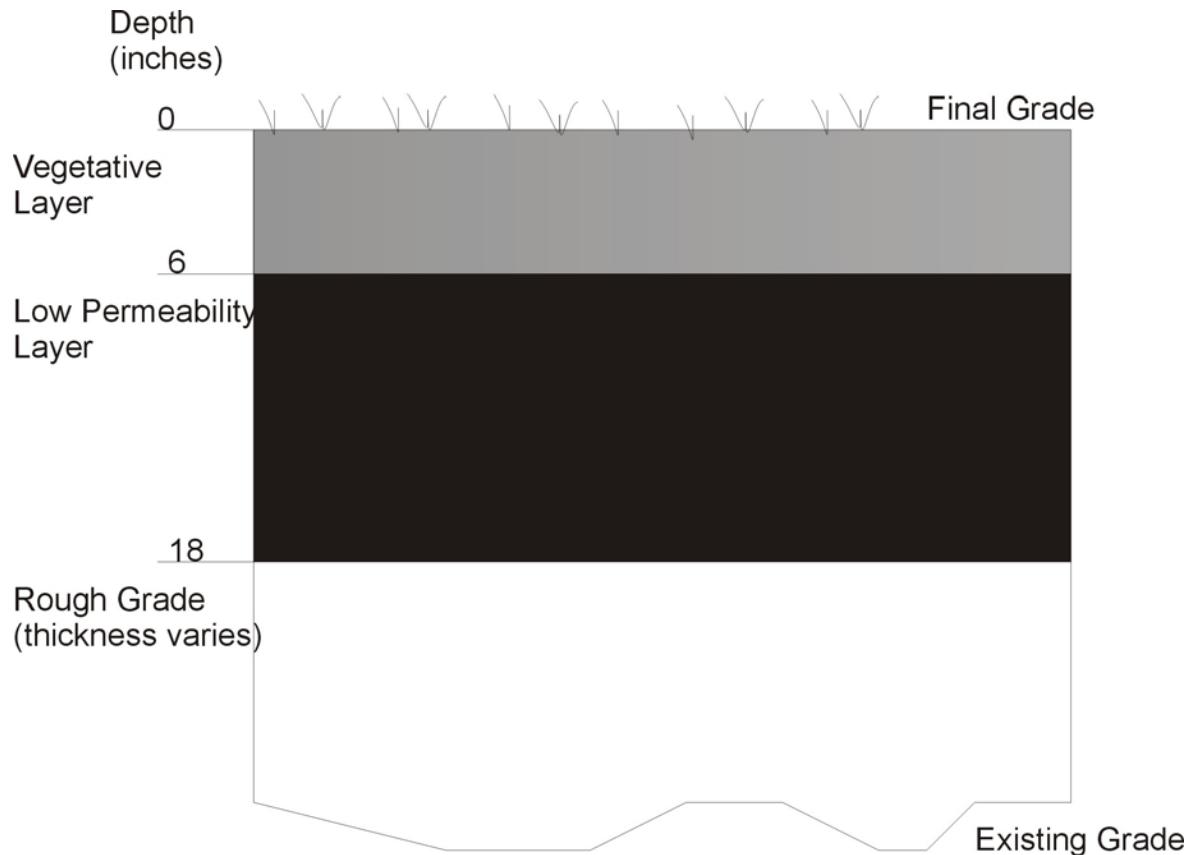


Figure 1-3. Schematic of Central Facilities Area landfill covers.

grubbed to remove plants that could decompose and create voids. Fill material for all three layers was obtained from Spreading Area "B" at INL and placed over the landfills. The fill material was described as lean clay with sand. The general backfill and low-permeability soil layers were compacted to 95% of maximum dry density at 0 to ± 4 percentage points from optimum moisture content. In addition, a riprap layer was installed in Landfill II at its extreme northeast face, rather than revegetating the area, in an effort to prevent erosion caused by the steepness of the slope. A detailed description of the remedial action, including installation of the landfill covers, is provided in the *Remedial Action Report CFA Landfills I, II, and III Native Soil Cover Project Operable Unit 4-12* (DOE-ID 1997).

1.4 Monitoring Activities

The groundwater, soil-gas, and soil-moisture monitoring activities are summarized as follows:

- Groundwater monitoring
 - A total of nine monitoring wells were sampled: Four monitoring wells in the vicinity of Landfills III and I, one well south of Landfill II, and four monitoring wells south of CFA. Water levels in LF2-08, LF2-09, and LF2-11 at Landfill II and LF3-10 at Landfill III were too low to be sampled.
 - In June 2005, water levels were measured in 35 wells to evaluate the direction of groundwater flow (Table 1-1).

Table 1-1. Water-level measurement data for June 2005.

Well Name	Measurement Date	Land Surface Elevation (ft) ^a	Stickup (ft)	Depth to Water (ft)	Depth to Water (ft bbc)	E-line Correction (ft)	Deviation Correction (ft)	Water Level Elevation (ft amsl)
CFA-1931	06/13/2005	4931.25	2.33	487.55	485.22	0.25	0.23	4446.01
CFA-1932	06/13/2005	4938.08	2.66	494.00	491.34	0.25	0.25	4446.74
CFA-MON-A-001	06/13/2005	4936.44	1.73	498.12	496.39	0.27	0.04	4439.82
CFA-MON-A-002	06/22/2005	4932.24	2.59	494.16	491.57	0.26	0.05	4440.46
CFA-MON-A-003	06/13/2005	4930.31	2.34	493.76	491.42	0.27	0.03	4438.65
ICPP-MON-A-164B	06/15/2005	4948.66	3.05	504.75	501.70	0.27	0.00	4446.69
ICPP-MON-A-164C	06/15/2005	4951.89	3.23	508.10	504.87	0.27	0.02	4446.77
ICPP-MON-A-166	06/15/2005	4956.00	2.86	512.15	509.29	0.27	0.04	4446.48
ICPP-MON-A-167	06/15/2005	4946.71	3.12	DRY	—	—	—	—
LF2-08	06/13/2005	4931.72	1.62	489.45	487.83	0.25	3.00	4446.64
LF2-09	06/13/2005	4932.23	2.73	DRY	—	—	—	—
LF2-10	06/13/2005	4932.48	1.81	490.35	488.54	0.25	0.75	4444.44
LF2-11	06/13/2005	4928.36	1.90	483.70	481.80	0.25	0.09	4446.40
LF3-08	06/13/2005	4940.22	1.55	500.18	498.63	0.26	5.18	4446.51
LF3-09	06/13/2005	4941.08	2.37	DRY	—	—	—	—
LF3-10	06/13/2005	4942.78	2.79	DRY	—	—	—	—
M12S	06/14/2005	4975.28	2.16	543.59	541.43	0.00	0.07	4433.92
STF-MON-A-004	06/13/2005	4945.37	2.91	515.65	512.74	0.28	0.10	4432.45
USGS-020	06/15/2005	4916.36	2.05	473.04	470.99	0.26	0.07	4445.18
USGS-035	06/15/2005	4929.64	2.84	485.67	482.83	0.26	0.28	4446.83
USGS-036	06/15/2005	4929.20	2.43	484.74	482.31	0.26	0.05	4446.68
USGS-037	06/15/2005	4929.38	2.53	484.88	482.35	0.26	0.05	4446.82
USGS-038	06/15/2005	4929.63	2.64	485.23	482.59	0.26	0.06	4446.84

Table 1-1. (continued).

Well Name	Measurement Date	Land Surface Elevation (ft) ^a	Stickup (ft)	Depth to Water (ft)	Depth to Water (ft bbc)	E-line Correction (ft)	Deviation Correction (ft)	Water Level Elevation (ft amsl)
USGS-039	06/15/2005	4930.95	2.58	486.52	483.94	0.26	0.09	4446.84
USGS-077	06/14/2005	4921.79	3.49	478.43	474.94	0.26	0.01	4446.60
USGS-083	06/13/2005	4941.59	3.27	509.25	505.98	0.00	0.02	4435.63
USGS-085	06/13/2005	4939.26	2.28	494.98	492.70	0.25	0.13	4446.43
USGS-112	06/14/2005	4927.84	3.61	487.07	483.46	0.26	2.80	4446.91
USGS-113	06/14/2005	4925.28	3.60	487.63	484.03	0.26	5.91	4446.90
USGS-114	06/14/2005	4920.09	3.57	481.61	478.04	0.26	4.85	4446.63
USGS-115	06/14/2005	4918.84	3.58	477.65	474.07	0.26	2.18	4446.69
USGS-116	06/14/2005	4916.03	3.89	472.53	468.64	0.25	0.18	4447.31
USGS-127	06/13/2005	4956.44	1.83	516.62	514.79	0.28	0.10	4441.47
USGS-128	06/13/2005	4934.92	1.30	489.45	488.15	0.25	0.03	4446.55
USGS-130	06/13/2005	4927.53	1.31	486.37	485.06	0.25	0.09	4442.31

a. The land surface elevation is the brass cap elevation. The stickup is measured from the brass cap.

amsl = above mean sea level

bbc = below brass cap

- Soil-gas monitoring
 - In September 2005, five soil-gas monitoring wells near the landfills were sampled for volatile organic compounds (VOCs). Samples were taken from four depths in the vadose zone at each well. The depths were near the soil/basalt interface (~10 ft), in the basalt above the first interbed (~35 ft), in the basalt below the first interbed (~70 ft), and approximately 30 ft below the third depth (~100 ft). In addition, soil gas samples were collected at two vapor ports in CFA-1931 at depths of 265–270 ft and 470–475 ft and in CFA-1932 at depths of 255–260 ft and 465–470 ft.
- Soil-moisture monitoring
 - Soil moisture readings were obtained from five neutron-probe access tubes (NATs) at intervals to a depth of approximately 20 ft. Three NATs are associated with CFA Landfill II, with one NAT located on the landfill, one on the edge of the landfill, and one adjacent to the landfill. At Landfill III, one NAT is located on the landfill, and one NAT is located on the edge of the landfill. Because of instrument failure, the soil-moisture monitoring data cover only part of the period from October 2004 to October 2005.
 - Time-domain reflectometry (TDR) moisture data were obtained from a total of four arrays at 1-hr intervals from the surface to a depth of 8 ft. Two arrays are located on CFA Landfill II, and the other two arrays are located at CFA Landfill III. The TDR monitoring data cover the period from October 2004 to October 2005.

2. GROUNDWATER MONITORING RESULTS

Groundwater in the vicinity of CFA is monitored to ensure contaminants from the landfills do not migrate to the SRPA in excess of drinking water standards. Groundwater monitoring consists of water-level measurements and sampling.

2.1 Water-Level Measurements

Water levels were measured or attempted at 35 wells at and near CFA in June 2005 (Table 1-1). This total includes water levels from two new wells, CFA-1931 and CFA-1932. Water levels could not be determined for LF2-08, LF2-09, LF2-11, LF3-09 and LF3-10 because water levels were too low. The depth to groundwater was determined using surveyed measuring-point elevations and well-deviation correction factors. A groundwater-level contour map was plotted for the June 2005 data using all the water-level points, except LF2-10 (Figure 2-1). Well LF2-10 was not used for the water-level contour map because the well is screened more than 200 ft below the water table. The apparent groundwater flow direction from CFA Landfills I and III varies—from southeast to south to southwest—and is the same direction as that stated in the previous monitoring reports and the Five-Year Review (ICP 2004; ICP 2005; DOE-ID 2002a). The apparent direction of groundwater flow from Landfill II is predominantly southeast.

The most significant trend in water levels since October 2000 is that water levels have dropped approximately 9 to 10 ft in the CFA landfill wells. The drop in water level explains why groundwater sampling could not be performed at Wells LF2-09, LF2-08, LF2-11 and LF3-10 in October 2005. Although the water level has fallen approximately 9 ft since the year 2000, the gradients and flow directions have remained nearly the same since October 2000.

The groundwater gradient in the area covered by the water-level measurements varies considerably (see Figure 2-1). The gradient is slight over the area between Idaho Nuclear Technology and Engineering Center (INTEC) and the CFA landfills (more than 1 mile), with less than 2 ft of head difference. Steeper gradients are present south of CFA and to the east of CFA between the Security Training Facility (STF) and the Power Burst Facility. From CFA-1931 to CFA-MON-A-003 the average gradient is approximately 5.29 ft per mile. From LF3-08 to M12S the average gradient is approximately 5.43 ft per mile. These gradients are very similar to previous calculations.

2.2 Groundwater Analytical Data

Groundwater samples were collected and analyzed for VOCs, anions, metals, and alkalinity. The groundwater monitoring results are summarized for detected analytes at CFA landfills (Table 2-1) and downgradient of CFA (Table 2-2). As mentioned previously, the drop in water levels explains why groundwater sampling could not be performed at Wells LF2-09, LF2-08, LF2-11 and LF3-10 in October 2005. A complete listing of the groundwater results for samples collected in 2005 is provided in Appendix A and on CD-ROM in the back cover of this document.

The data for field-measured parameters—including temperature, pH, specific conductance, and dissolved oxygen—are summarized along with well construction data in Table 2-3. The pH data indicated that samples were neutral to slightly alkaline. The dissolved oxygen data indicated that the samples were close to dissolved oxygen saturation. Specific conductance measurements varied widely from 0.271 to 0.822 mmhos/cm, with the wells affected by the INTEC plume having much higher specific conductance measurements.

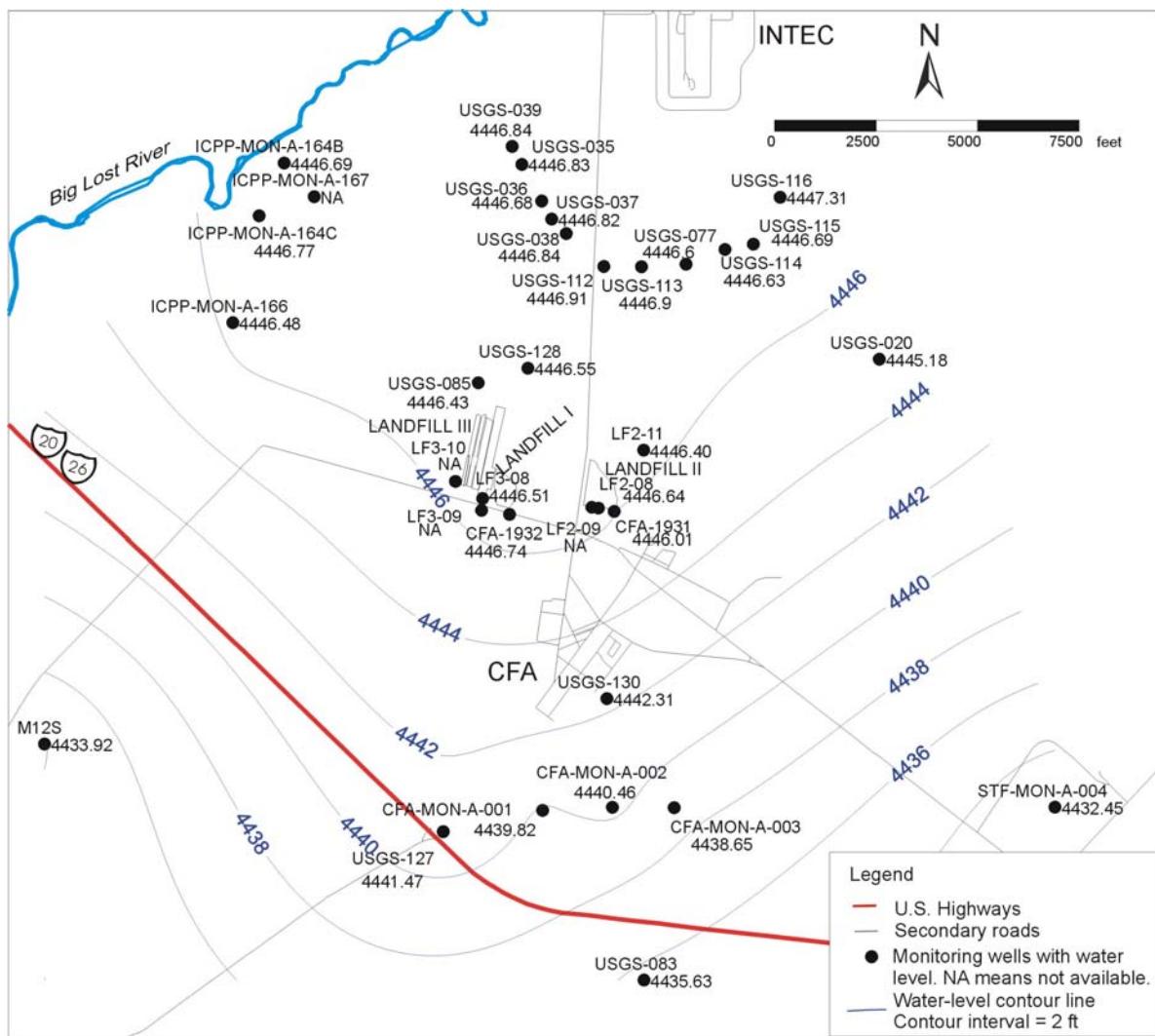


Figure 2-1. Groundwater-level contour map for June 2005, showing wells and measured water levels.

Table 2-1. Summary of detected groundwater analytes for October 2005 sampling at Central Facilities Area Landfills I, II, and III.

Analyte	Units	CFA-1931			CFA-1932			LF3-08			LF3-09			USGS-128			CFA-1932		
		Result	L ^a	V	Result	L	V	Result	L	V	Result	L	V	Result	L	V	Result	L	V
Inorganics																			
Arsenic	ug/L	—			3.4	B	—	—			—			—			3	B	
Barium	ug/L	116	B	—	107	B	101	B	131	B	86.4	B	—	—		108	B		
Cadmium	ug/L	—			—		—	0.19	B	—	21.6		—	30.6	*N	R	—		
Chromium	ug/L	37	*N	R	27.1	*N	22.6	176		18.2	B	0.27	B	1.1	B				
Cobalt	ug/L	1.2	B	—	1.1	B	J	0.97	B	14.2		3.4		9.2	*	J			
Copper	ug/L	3.4	*	J	10.6	*	1.8	14.2		—		—		0.93	B				
Lead	ug/L	0.75	B	—	1.1	—	1.2	4.2		—		—		61.2					
Nickel	ug/L	49.1	—		54.2	—	15.3	B	775		—		3.1	B	10.1	B			
Vanadium	ug/L	12.1	B	—	8.5	B	—	—		—		—		7.1	B	13.5	B		
Zinc	ug/L	—			13.4	B	61.9	551		—		—		—					
Anions																			
Alkalinity ^c	mg/L	127	—		122	—	127		113		141		141		123				
Chloride	mg/L	104	—		94.5	R ^b	58.1	J	146	J	17.7	J	17.7	J	95.1				
Fluoride	mg/L	0.201	J	—	0.209	J	0.228	J	0.192	J	0.206	J	0.206	J	0.204	J			
Nitrogen, Nitrate/Nitrite	mg/L	1.94	—		2.22	—	2.5	3.02		1.24		1.24		2.08					
Sulfate	mg/L	31.6	—		29.4	—	31.5	32	37.9		—		—		29.5				
Organics																			
Chloroform	ug/L	0.73	J	J	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Toluene	ug/L	2.3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	

a. Data qualifier flags are defined in Appendix A. An “L” indicates a laboratory flag, and “V” indicates a validation flag.

b. Note that chloride result was qualified with an “R-rejected.” However, result is consistent with nearby wells.

c. Alkalinity was reported as mg/L CaCO₃.

Table 2-2. Summary of detected groundwater analytes for October 2005 sampling of wells downgradient of Central Facilities Area.

Analyte	Units	CFA-MON-001			CFA-MON-002			CFA-MON-003			USGS-083			USGS-083 (Dup)		
		Result	L ^a	V	Result	L	V	Result	L	V	Result	L	V	Result	L	V
Inorganics																
Arsenic	ug/L	2	B	—	—	—	—	1.9	B	2.4	B	2	B	—	—	—
Barium	ug/L	25	B	48	B	40	B	27.8	B	27.5	B	—	—	—	—	—
Chromium	ug/L	12.1	—	26.1	—	11.5	—	12.9	—	12.4	—	—	—	—	—	—
Cobalt	ug/L	0.51	B	0.99	B	0.29	B	0.14	B	0.13	B	—	—	—	—	—
Copper	ug/L	1.2	—	6.3	—	1.8	—	0.97	B	0.85	B	—	—	—	—	—
Lead	ug/L	—	—	1.6	—	1	—	1.3	—	1.2	—	—	—	—	—	—
Nickel	ug/L	9.9	B	21.2	B	2.5	B	1.5	B	1	B	—	—	—	—	—
Zinc	ug/L	53.9	—	110	—	30.1	—	166	—	159	—	—	—	—	—	—
Anions																
Alkalinity ^b	mg/L	94.2	—	95.2	—	93.2	—	88.2	—	90.2	—	—	—	—	—	—
Chloride	mg/L	22.9	J	55	J	42.9	J	10.9	J	10.9	J	—	—	—	—	—
Fluoride	mg/L	0.246	J	0.189	J	0.22	J	0.264	J	0.274	J	—	—	—	—	—
Nitrogen, Nitrate/Nitrite	mg/L	1.68	—	17.9	—	24	—	0.592	—	0.628	—	—	—	—	—	—
Sulfate	mg/L	19.9	—	29.1	—	24.9	—	20.2	—	20	—	—	—	—	—	—
Organics																
Methane	ug/L	25.3	—	190	—	—	—	—	—	—	—	—	—	—	—	—

a. Data qualifier flags are defined in Appendix A. An "L" indicates a laboratory flag, and "V" indicates a validation flag.

b. Alkalinity was reported as mg/L CaCO₃.

Table 2-3. Summary of physical parameters and well construction details for October 2005 sampling.

Well Name	Date Sampled	Open/Screen Interval (ft bls)	Pump Depth (ft bls)	Water Level (ft bls)	Temperature (C°)	Specific Conductivity (mmhos/cm)	Dissolved Oxygen (mg/L)	pH
LF2-08	NS	485 to 495	484	NS	—	—	—	—
LF2-09	NS	469 to 497	486	NS	—	—	—	—
LF2-11	NS	466 to 499	485	NS	—	—	—	—
LF3-08	10/5/2005	500 to 510	504	499.08	12.11	0.550	8.17	7.90
LF3-09	10/5/2005	480 to 500	493	492.95	11.51	0.822	8.76	7.88
LF3-10	NS	481 to 501	494	NS	—	—	—	—
CFA-1931	10/27/2005	480 to 520	507	485.31	12.04	0.705	5.66	7.76
CFA-1932	10/26/2005	485 to 525	509	492.2	12.44	0.672	5.68	7.71
CFA-MON-A-001	10/3/2005	488 to 518	514	495.39	11.03	0.324	8.3	8.01
CFA-MON-A-002	10/4/2005	488 to 518	516	491.98	11.24	0.600	8.21	7.97
CFA-MON-A-003	10/3/2005	491 to 511	508	491.47	11.18	0.472	8.65	7.85
USGS-083	10/3/2005	OH 516 to 752	606	505.88	11.76	0.271	7.5	8.11
USGS-128	10/5/2005	OH 451 to 610	523	488.6	12.42	0.434	8.78	7.83

bls = below land surface

NS = not sampled

OH = open hole

A comparison of maximum concentrations for detected analytes versus background and the defined regulatory level is provided in Table 2-4. Nitrate was detected above its maximum contaminant level (MCL) in two wells and chromium occurred above its MCL in one well. Nitrate was greater than the 10 mg/L MCL for sensitive populations in CFA-MON-A-002 (17.9 mg/L) and CFA-MON-A-003 (24 mg/L). As defined, sensitive populations for nitrate include infants. Before this sampling round, the nitrate concentration in CFA-MON-A-003 was 8 to 11 mg/L. Except for CFA-MON-A-002 and CFA-MON-A-003, all other wells had nitrate concentrations at less than 4 mg/L. Except for the spike in CFA-MON-A-003 in 2005, nitrate concentrations in CFA-MON-A-002 and -003 have generally remained relatively steady over time (Figure 2-2).

The high chromium and zinc concentrations in LF3-09 are anomalous relative to recent data for this well. Because of the low water level in this well, it is possible that suspended sediments may be responsible for elevated metals concentrations in this well. However, because of an error, iron and aluminum were not analyzed in the CFA samples; thus, the influence of sediment cannot be evaluated.

Historically, high zinc, lead, and iron concentrations in groundwater samples collected from several wells as part of the CFA groundwater monitoring and sampling program were the result of rusting carbon-steel casing and galvanized riser pipe used in the older groundwater-monitoring wells. Figure 2-3 depicts lead and zinc concentrations for Well CFA-MON-A-003, demonstrating the relationship of lead and zinc concentrations in groundwater as a result of galvanic corrosion. After the galvanized riser pipe was replaced with stainless-steel riser pipe in CFA-MON-A-003 in August 2001, the lead concentration decreased below the action level of 15 µg/L and the zinc concentration decreased substantially (Figure 2-3).

The wells in the vicinity of the CFA landfills have elevated levels of chloride relative to background concentrations. The elevated chloride concentrations in the CFA landfill wells are due to upgradient impacts from INTEC (DOE-ID 2002b; DOE-ID 2003). Chloride concentrations have remained relatively steady in the landfill wells since the wells were first sampled.

Toluene, chloroform, and methane were the only volatile organic compounds detected. Toluene and chloroform were detected in one well at concentrations near their detection limits. Toluene is a common laboratory contaminant and its occurrence could be the result of laboratory contamination. The chloroform detection was near its detection limit (0.73 µg/L) and well below the MCL of 100 µg/L. Methane was detected in two wells, CFA-MON-A-001 and CFA-MON-A-002 downgradient of CFA. There is no MCL for methane in groundwater.

Table 2-4. Background and regulatory levels for detected analytes.

Compound	Units	Maximum Detected Value	Location of Maximum Detected Value	MCL or SMCL ^a	LF2-11 Upgradient Well ^b	Background ^c	Detections Above Background and Upgradient Well	Number of Wells with Detections Above MCL or SMCL	
								Detections Above Background and Upgradient Well	Detections Above Background and Upgradient Well
Anions									
Alkalinity-bicarbonate	mg/L	141	USGS-128	None	136	169-174	No	NA	NA
Chloride	mg/L	146	LF3-09	250	107	16-27	Yes	0	0
Fluoride	mg/L	0.274	USGS-083	2	0.15	0.3-0.5	No	0	0
Nitrate/nitrite	mg-N/L	24	CFA-MON-A-003	10	3.3	1-2	Yes	2	2
Sulfate	mg/L	37.9	USGS-128	250	29.6	24-31	Yes	0	0
Organic Analytes									
Toluene	µg/L	3.2	CFA-1931	1,000	ND	NA	NA	0	0
Chloroform	µg/L	0.73	CFA-1931	100	ND	NA	NA	0	0
methane	µg/L	190	CFA-MON-A-002	None	ND	NA	NA	NA	NA
Inorganic Analytes									
Antimony	µg/L	ND	—	6	ND	NA	NA	0	0
Aluminum	µg/L	NS	—	50-200	240	10-13	—	—	—
Arsenic	µg/L	5.4	CFA-MON-A-002	10	ND	2-3	Yes	0	0
Barium	µg/L	91.5	USGS-128	2,000	160	50-70	Yes	0	0
Beryllium	µg/L	ND	—	4	ND	N	—	0	0
Cadmium	µg/L	0.19	LF3-09	5	ND	<1	No	0	0
Chromium	µg/L	176	LF3-09	100	23.3	2-3	Yes	1	1
Copper	µg/L	14.2	LF3-09	1,300/1,000	ND	<1	No	0	0
Iron	µg/L	NS	—	300	872	16-25	—	—	—
Lead	µg/L	4.2	LF3-09	15 ^d	ND	1-5	No	0	0

Table 2-4. (continued).

Compound	Units	Maximum Detected Value	Location of Maximum Detected Value	MCL or SMCL ^a	LF2-11		Detections Above Background and Upgradient Well	Number of Wells with Detections Above MCL or SMCL
					Upgradient Well ^b	Background ^c		
Manganese	µg/L	NS	—	50	8.1	7	NA	0
Mercury	µg/L	ND	LF3-08	2	ND	N	N	0
Nickel	µg/L	551	LF3-09	None	11.7	N	Yes	NA
Selenium	µg/L	ND	—	50	ND	<1	N	0
Vanadium	µg/L	12.1	CFA-1931	None	ND	N	N	NA
Zinc	µg/L	551	LF3-09	5,000	ND	10.5–54	Yes	0

a. Numbers in italics here are for the SMCL.
 b. Data for LF2-11 are from 2002, because the well could not be sampled in 2003 or 2004.
 c. Background is from two sources: plain numbers are from Knobel, Orr, and Cecil (1992). Italicized numbers are from USGS (1999)—median and mean values.
 d. The action level for lead is 15 µg/L.

MCL = maximum contaminant level
 N = not determined
 NA = not applicable
 ND = not detected
 NS = not sampled
 SMCL = secondary maximum contaminant level

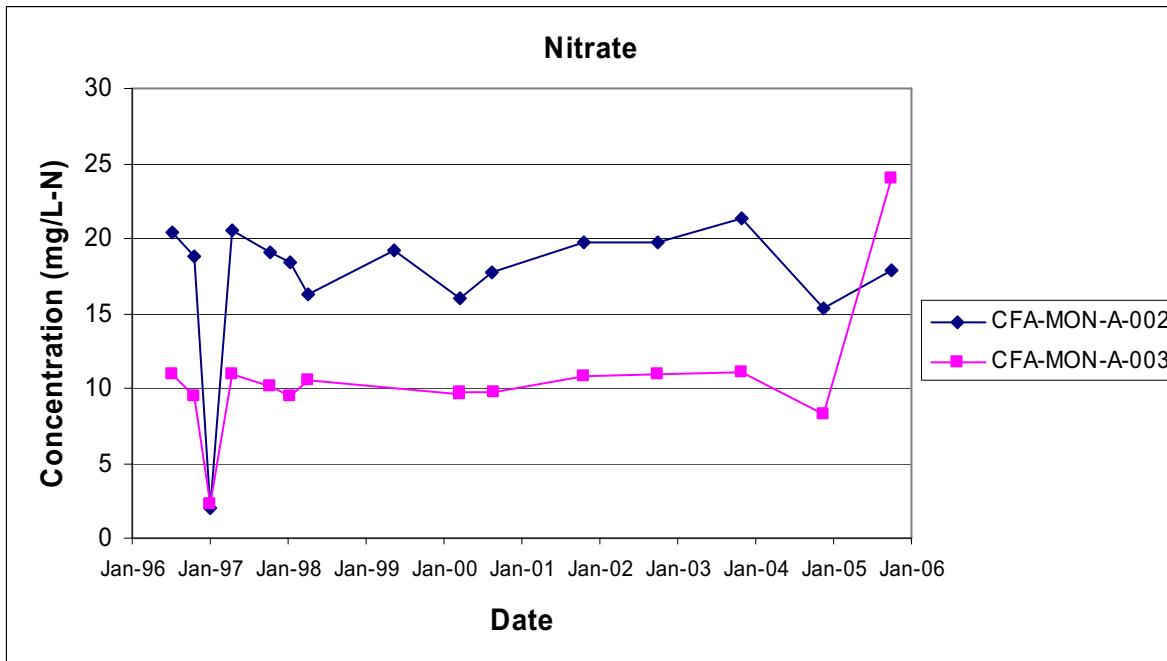


Figure 2-2. Nitrate concentration trends in groundwater from Wells CFA-MON-A-002 and CFA-MON-A-003.

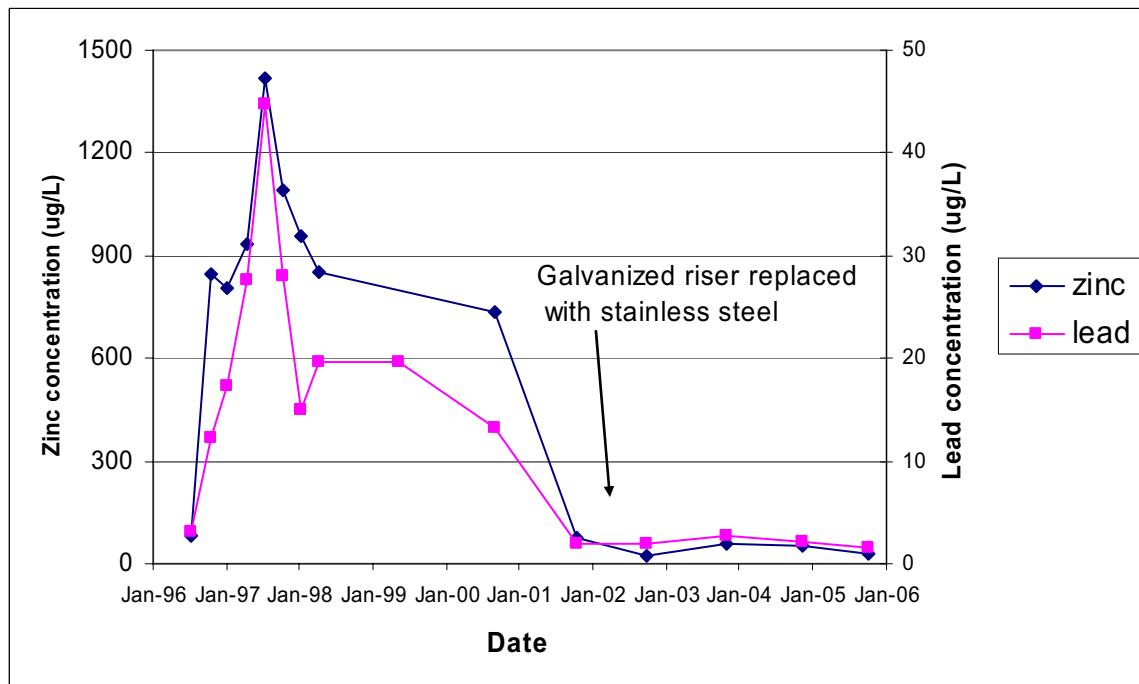


Figure 2-3. Trends for zinc and lead in groundwater from Well CFA-MON-A-003.

3. SOIL-GAS MONITORING RESULTS

The locations of the five soil-gas boreholes and two monitoring wells equipped with gas sampling ports are shown in Figure 3-1. The four gas-sampling ports at each soil-gas borehole and two gas-sampling ports on the two new monitoring wells were sampled. Samples were collected at discrete depths.

The rationale for the sampling intervals for the five soil-gas boreholes is as follows: One shallow sampling port was placed within the surficial sediments at a depth of approximately 13 ft. A second sampling port was placed in basalt at a depth of approximately 38 ft above the shallow interbed, which is located approximately 40 to 60 ft below land surface (bls). Two deep sampling ports were placed below the shallow interbed, with perforated sections vertically separated by approximately 30 ft. The depths of these two ports are approximately 78 and 108 ft. The actual sampling depths for the gas-sampling ports are given as footnotes in Table 3-1. The perforated sections of the deep sampling ports were located adjacent to fracture zones, because they are the most probable avenues of soil-gas migration. Soil-gas samples were collected for VOCs, including methane, on September 28, 2005.

The rationale for placement of the two soil gas ports in the monitoring wells is as follows: the first deep port was located between the lowest sampling port for the soil gas boreholes and the deepest sampling locations located near the water table to potentially provide gradient information on soil gas concentrations. The deepest ports in the monitoring wells are located several feet above the water table to provide an indication of the potential impact of soil gas contaminants on groundwater.

A summary of the commonly detected analytes in the soil-gas samples from the boreholes is provided in Table 3-1, and a similar summary for detected analytes from soil gas sampling ports in the monitoring wells is provided in Table 3-2. A complete listing of results is provided in Appendix A and on CD-ROM in the back cover of this document. The VOC that occurred at the highest concentration in the 2005 vapor sampling was trifluorochloromethane at 6,200 parts per billion by volume (ppbv). In most previous years, 1,1,1-trichloroethane occurred at the highest concentration in soil gas samples. In 2005, the highest 1,1,1-trichloroethane concentration was 4,700 ppbv in GSP3-2 at a nominal depth of 107.5 ft.

Historically, the VOCs that have been detected consistently in the soil-gas samples include 1,1,1-trichloroethane, 1,1-dichloroethane, 1,1-dichloroethene, dichlorodifluoromethane, trichlorofluoromethane, trichloroethene, 1,1,2-trichloro-1,2,2-trifluoroethane (F-113), cis-1,2-dichloroethene, carbon tetrachloride, and tetrachloroethene. A summary of commonly detected analytes in the soil gas samples is provided in Table 3-1. These compounds are refrigerants, common solvents, products of solvent degradation, and constituents found in solvents that are used to clean mechanical equipment. Generally, the upper soil-gas locations at a depth of 10 to 13 ft bls were low in VOC concentrations, with the highest VOC concentrations at the intermediate sample-port depths of approximately 35 to 38 ft bls and 70 to 78 ft bls. The VOC concentrations then generally decreased in samples collected from the lowermost locations at 100 to 108 ft bls.

At GSP1-1, most analytes were within their historical average concentration range. The analytes occurring at the highest concentrations in GSP1-1 were 1,1,1-trichloroethane, 1,1-dichloroethene, trichloroethene, and trichlorofluoromethane. The concentration trends for these four compounds are shown in Figures 3-2a–d. The upward trends in trichloroethene and 1,1-dichloroethene concentrations at a depth of 37.5 ft appear to have reversed. The concentrations of trichloroethene and trichlorofluoromethane increased noticeably in the sample collected at 77.5 ft, but both compounds were nearly the same as the previous year's result in the sample collected at 107.5 ft.

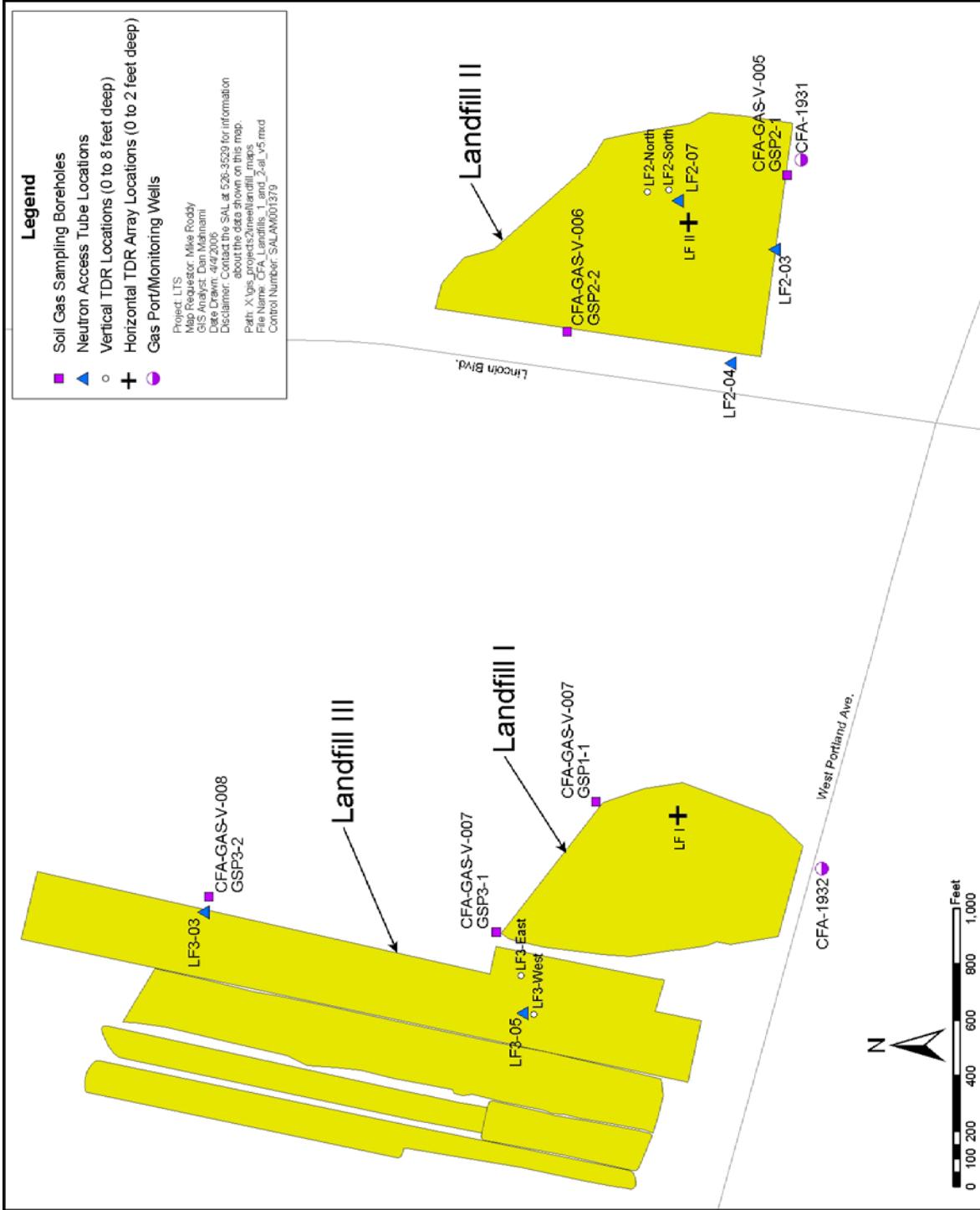


Figure 3-1. Locations of soil-gas boreholes, time-domain reflectometry arrays, and neutron-probe access tubes.

Table 3-1. Summary of detected soil-gas analytes (in parts per billion by volume) for September 28, 2005.^a

Depth (ft)	Compound	GSP1-1 ^b	LF	VF	GSP2-1 ^c	LF	VF	GSP2-2 ^d	LF	VF	GSP3-1 ^e	LF	VF	GSP3-2 ^f	LF	VF
12.5	1,1,1-Trichloroethane	47		15		1600	D		86						90	
37.5	1,1,1-Trichloroethane	4300	D	12		760	D		3200	D					530	
77.5	1,1,1-Trichloroethane	2200	D	45		61			2100	D					15	
107.5	1,1,1-Trichloroethane	24		18		780	D		18					4700	D	
12.5	1,1-Dichloroethane	8.6		ND		3000	D		21					13		
37.5	1,1-Dichloroethane	610	D	ND		2500	D		880	D				150		
77.5	1,1-Dichloroethane	570	D	25		110			500	D				1.3		
107.5	1,1-Dichloroethane	1.4		7.6		1400	D		2.5					860	D	
12.5	1,1-Dichloroethene	22		63		63			44					8.9		
37.5	1,1-Dichloroethene	2700	D	62		62			1100	D				ND		
77.5	1,1-Dichloroethene	1600	D	9.3		9.3			1600	D				3		
107.5	1,1-Dichloroethene	8.3		81		81			6.9					960	D	
12.5	Carbon tetrachloride	ND		ND		ND			ND					ND		
37.5	Carbon tetrachloride	1.6		2.7		2.6			ND					ND		
77.5	Carbon tetrachloride	6.9		12		2			ND					ND		
107.5	Carbon tetrachloride	ND		4		23			ND					1.5		
12.5	Chloroform	ND		ND		18			ND					2.6		
37.5	Chloroform	17		ND		20			32					ND		
77.5	Chloroform	23		6.9		1.9			27					ND		
107.5	Chloroform	ND		4.2		14			ND					9.2		
12.5	cis-1,2-Dichloroethene	ND		6.1		3000	D		1.7					5.1		
37.5	cis-1,2-Dichloroethene	21		2.5		1600	D		35					29		
77.5	cis-1,2-Dichloroethene	7.1		2.9		45			1.7					ND		
107.5	cis-1,2-Dichloroethene	ND		1.9		250	D		ND					110		

Table 3-1. (continued).

Depth (ft)	Compound	GSP1-1 ^b	LF	VF	GSP2-1 ^c	LF	VF	GSP2-2 ^d	LF	VF	GSP3-1 ^e	LF	VF	GSP3-2 ^f	LF	VF
12.5	Dichlorodifluoromethane	9		19		1000	D		30						ND	
37.5	Dichlorodifluoromethane	1600	D	75		1500	D		2200	D					540	
77.5	Dichlorodifluoromethane	1700	D	180	D	100			2000	D				1.6		
107.5	Dichlorodifluoromethane	ND		65		2200	D		8.8					330	E	
12.5	Ethane, 1,2-dichloro-1,1,2-trifluor	ND				40	NJ	NJ	6.9	NJ	NJ	5.2	NJ	NJ		
37.5	Ethane, 1,2-dichloro-1,1,2-trifluor	ND				6.6	NJ	NJ	26	NJ	NJ	44	NJ	NJ		
77.5	Ethane, 1,2-dichloro-1,1,2-trifluor	ND				11	NJ	NJ	20	NJ	NJ	50	NJ	NJ		
107.5	Ethane, 1,2-dichloro-1,1,2-trifluor	ND				3.1	NJ	NJ	22	NJ	NJ	ND				
12.5	1,1,2-Trichlorotrifluoroethane	6.6		3					44			24			66	
37.5	1,1,2-Trichlorotrifluoroethane	1000	D	12		220	D					1400	D		500	
77.5	1,1,2-Trichlorotrifluoroethane	1200	D	36		34			1400	D				2.5		
107.5	1,1,2-Trichlorotrifluoroethane	ND		10		480	D					6.6			2800	D
12.5	Methane, dichlorofluoro-	ND				22	NJ	NJ	4.3	NJ	NJ	ND				
37.5	Methane, dichlorofluoro-	74	NJ	NJ	ND	73	NJ	NJ	130	NJ	NJ	44	NJ	NJ		
77.5	Methane, dichlorofluoro-	91	NJ	NJ	7.6	NJ	NJ	31	NJ	NJ	110	NJ	NJ	ND		
107.5	Methane, dichlorofluoro-	ND				3.1	NJ	NJ	120	NJ	NJ	1.6	NJ	NJ	150	NJ
12.5	Phenol	29	NJ	NJ	ND	ND			ND			ND			ND	
37.5	Phenol	ND			ND	ND			ND			ND			ND	
77.5	Phenol	ND			ND	ND			ND			ND			ND	
107.5	Phenol	ND			ND	ND			ND			ND			ND	
12.5	Tetrachloroethene	14		28		260	D		1.8			34				
37.5	Tetrachloroethene	340	D	28		440	D		450	D		130				
77.5	Tetrachloroethene	57		39		29			20			7.8				
107.5	Tetrachloroethene	3.5		24		400	D		ND			15				

Table 3-1. (continued).

Depth (ft)	Compound	GSP1-1 ^b	LF	VF	GSP2-1 ^c	LF	VF	GSP2-2 ^d	LF	VF	GSP3-1 ^e	LF	VF	GSP3-2 ^f	LF	VF
12.5	Trichloroethene	20		17		120					5.4			61		
37.5	Trichloroethene	630	D	17		280	D				440	D		140		
77.5	Trichloroethene	3100	D	17		20					98			6.6		
107.5	Trichloroethene	4.6		8.9		200	D				ND			120		
12.5	Trichlorofluoromethane	10		8.5		640	D				27			33		
37.5	Trichlorofluoromethane	2100	D	23		1100	D				2500	D		450		
77.5	Trichlorofluoromethane	2600	D	66		170	D				2800	D		3.1		
107.5	Trichlorofluoromethane	1.2		22		4300	D				11			6200	D	

a. Two columns are shown for data qualifiers. The first column "LF" is the lab qualifier flag and the second column "VF" is the validation flag. See Appendix A for definitions of data qualifiers.

b. Depths shown are proposed depths from the Post-ROD Monitoring Work Plan (INEEL 2003b). Actual sample depths are 8.5–11.5 ft, 43–46 ft, 64–67 ft, and 95–98 ft.

c. Depths shown are proposed depths from the Post-ROD Monitoring Work Plan (INEEL 2003b). Actual sample depths are 11–14 ft, 41–46 ft, 66–69 ft, and 94–97 ft.

d. Depths shown are proposed depths from the Post-ROD Monitoring Work Plan (INEEL 2003b). Actual sample depths are 15–18 ft, 39–42 ft, 64–67 ft, and 90–99 ft.

e. Depths shown are proposed depths from the Post-ROD Monitoring Work Plan (INEEL 2003b). Actual sample depths are 11–14 ft, 40–43 ft, 74–77 ft, and 101–104 ft.

f. Depths shown are proposed depths from the Post-ROD Monitoring Work Plan (INEEL 2003b). Actual sample depths are 9–12 ft, 44–47 ft, 68–71 ft, and 101–104 ft.

ND = not detected.

Table 3-2. Summary of detected soil-gas analytes in soil-gas ports in CFA-1931 and CFA-1932 for 2005 (in parts per billion by volume).

Compound	CFA-1931		CFA-1931		CFA-1932		CFA-1932	
	295–300 ft	VF	470–475 ft	VF	255–260 ft	VF	465–470 ft	VF
1,1,1-Trichloroethane	96		8.3		3.6		2.1	
1,1,2-Trichlorotrifluoroethane	50		ND		ND		ND	
1,1-Dichloroethane	67		ND		ND		ND	
1,1-Dichloroethene	14		ND		ND		ND	
2-Butanone	ND		ND		ND		1.4	
Acetone	25	J	90		ND		8.8	
Benzene	ND		19		ND		ND	
Carbon disulfide	10		ND		ND		ND	
Chloroform	38		ND		ND		ND	
Chloromethane	ND		ND		1.2		ND	
Dichlorodifluoromethane	420		ND		ND		ND	
Tetrachloroethene	64		12		3.6		2.4	
Trichloroethene	39		340		2.6		1.4	
Trichlorofluoromethane	170		ND		1.9		ND	

ND = not detected

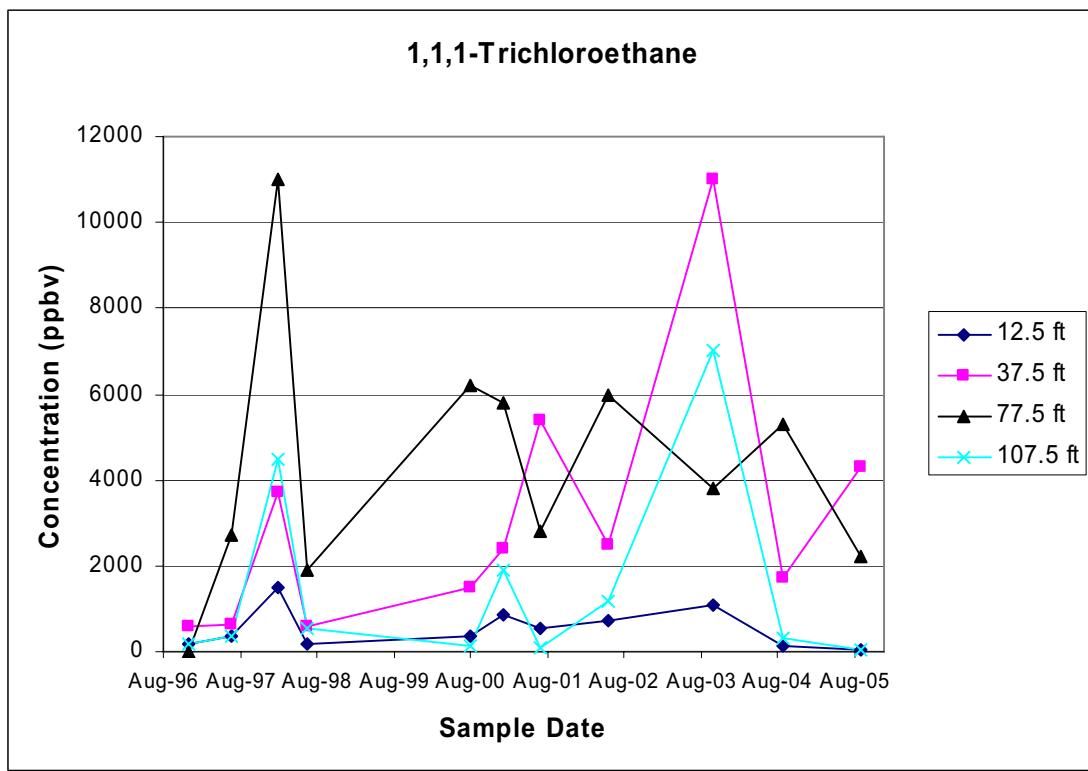


Figure 3-2a. Vapor trends for 1,1,1-trichloroethane in Well GSP1-1 (CFA-GAS-V-004) at Landfill I.

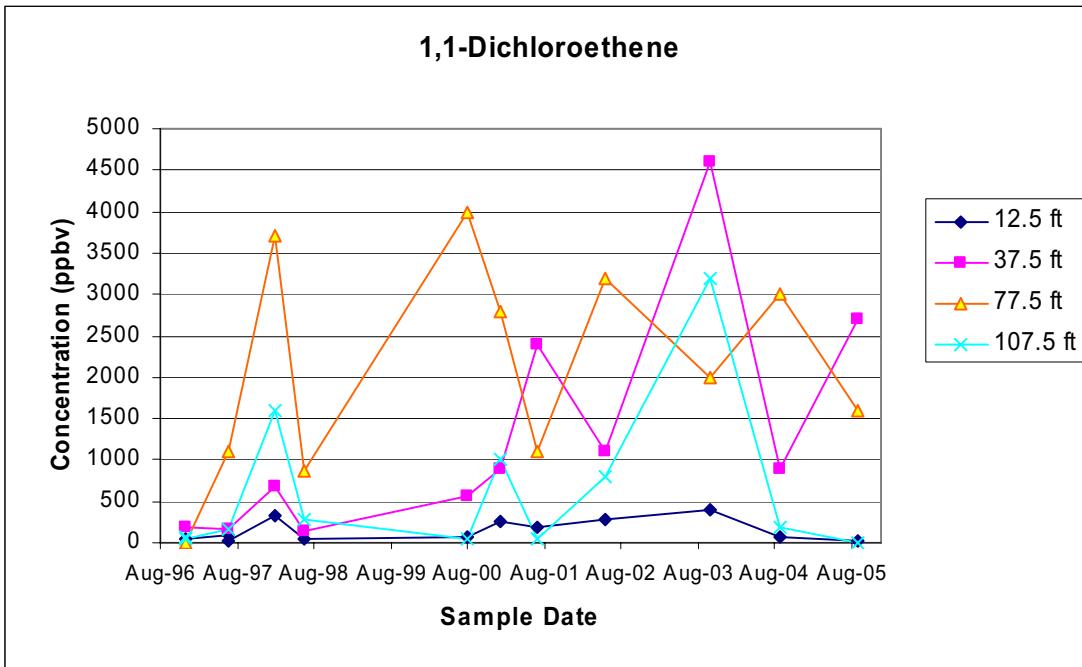


Figure 3-2b. Vapor trends for 1,1-dichloroethene in Well GSP1-1 (CFA-GAS-V-004) at Landfill I.

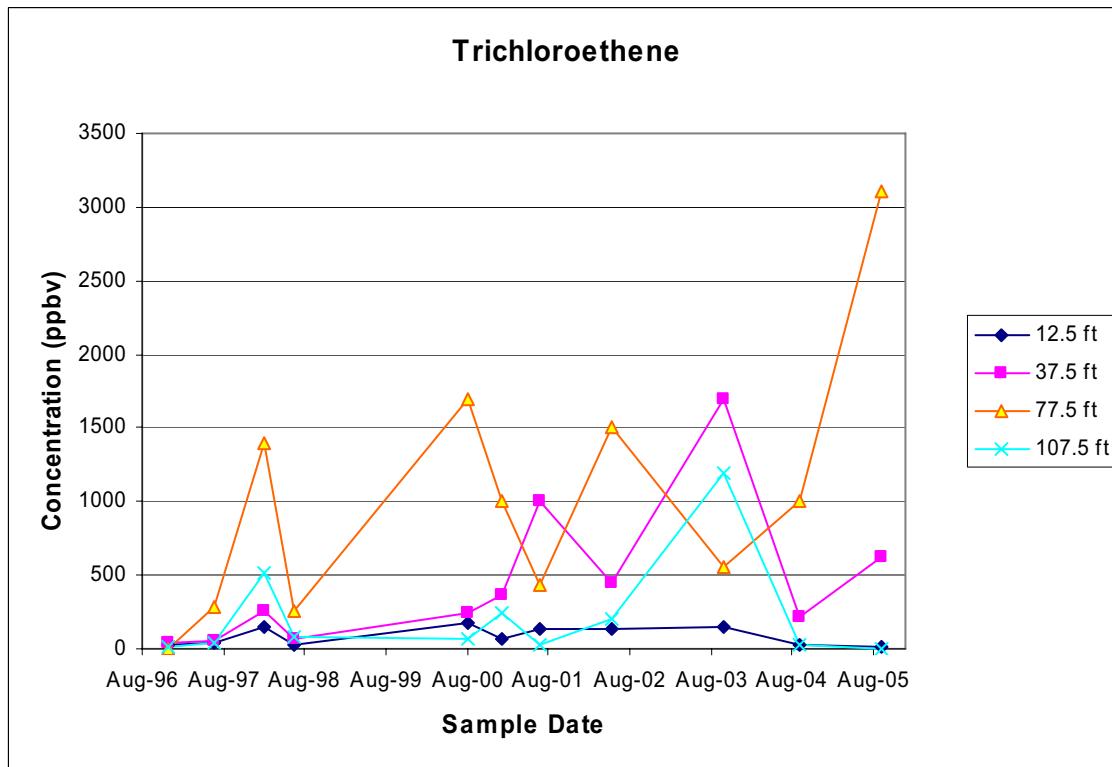


Figure 3-2c. Vapor trends for trichloroethene in Well GSP1-1 (CFA-GAS-V-004) at Landfill I.

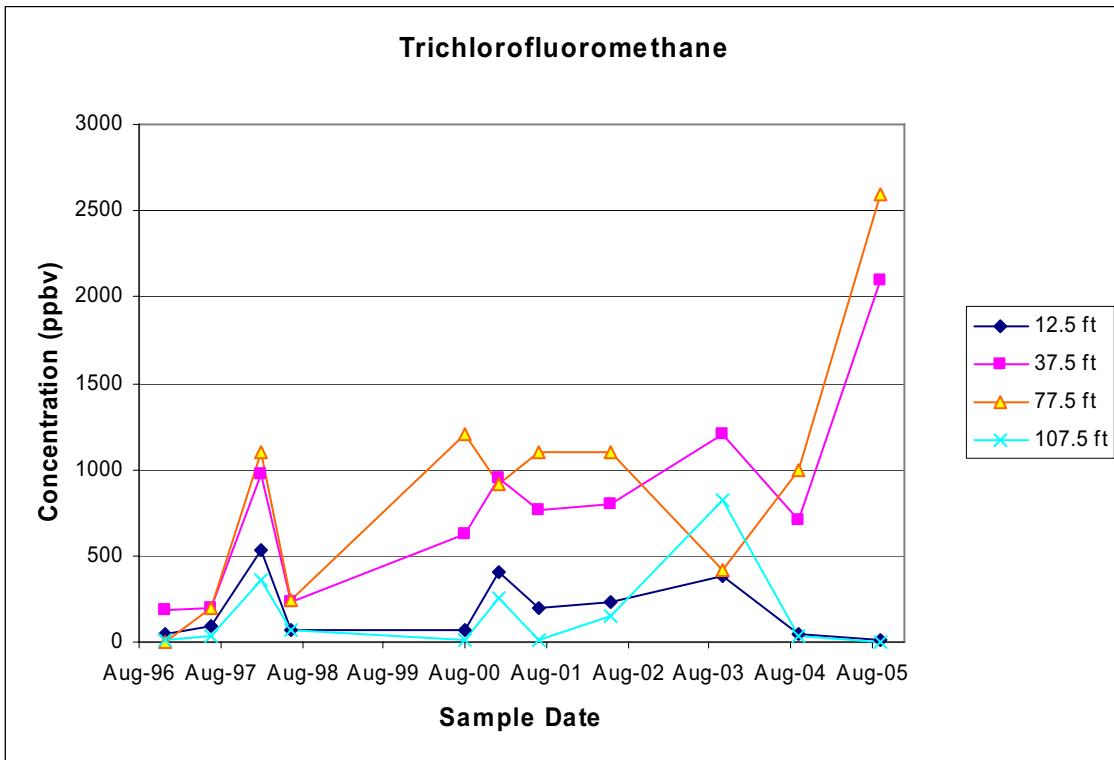


Figure 3-2d. Vapor trends for trichlorofluoromethane in Well GSP1-1 (CFA-GAS-V-004) at Landfill I.

VOC concentrations in GSP2-1 are generally lower than in the other gas-monitoring wells, and VOC trends for this location were not plotted for that reason. Analytes detected in GSP2-1 were below 1,000 ppbv in concentration.

At GSP2-2, the compounds occurring at the highest concentrations were 1,1,1-trichloroethane, 1,1-dichloroethane, dichlorodifluoromethane, trichlorofluoromethane, and cis-1,2-dichloroethene. The concentration trends for 1,1,1-trichloroethane, 1,1-dichloroethane, dichlorodifluoromethane, and trichlorofluoromethane are shown in Figures 3-3a–d to illustrate representative data trends. There does not appear to be a distinct trend direction for 1,1,1-trichloroethane, 1,1-dichloroethane, and cis-1,2-dichloroethene. Dichlorodifluoromethane and trichlorofluoromethane concentrations showed an increase in the 77.5-ft sample. Dichlorodifluoromethane appears to have resumed an uptrend in the 37.5-ft depth.

At GSP3-1, the compounds occurring at the highest concentrations were 1,1,1-trichloroethane, dichlorodifluoromethane, trichlorofluoromethane, and 1,1-dichloroethene. The concentration trends for 1,1,1-trichloroethane and 1,1-dichloroethene are shown in Figures 3-4a–b to illustrate representative data trends. Both 1,1,1-trichloroethane and 1,1-dichloroethene appear to have reversed their apparent trends in the 107.5-ft sample, based on the current sampling results.

At GSP3-2, the compounds occurring at the highest concentrations were 1,1,1-trichloroethane, trichlorofluoromethane, and dichlorodifluoromethane. Figures 3-5a–b are provided to show the concentration trends for 1,1,1-trichloroethane and trichlorofluoromethane, because they occurred at high concentrations. Based on the 2004 and 2005 data, the previous trends of increasing concentrations for 1,1,1-trichloroethane and trichlorofluoromethane at a depth of 77.5 ft have started to reverse, but more data points are needed to confirm the trend direction since soil gas concentrations have shown a wide degree of variability.

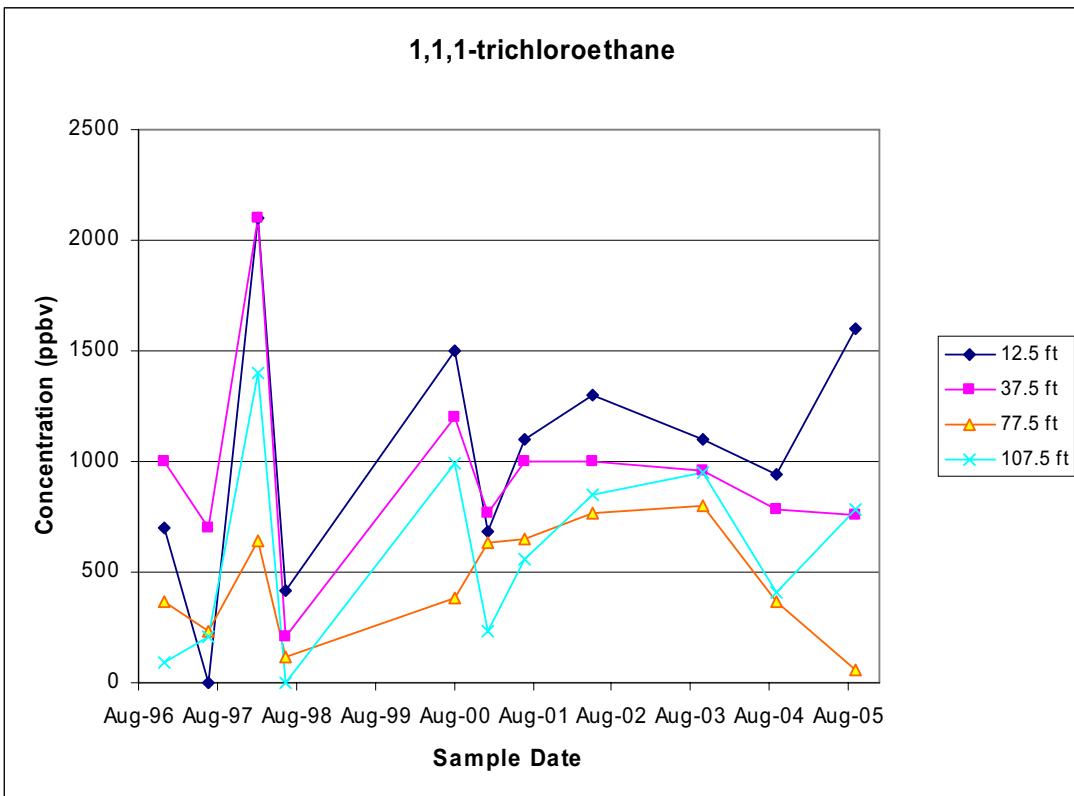


Figure 3-3a. Vapor trends for 1,1,1-trichloroethane in Well GSP2-2 (CFA-GAS-V-006) at Landfill II.

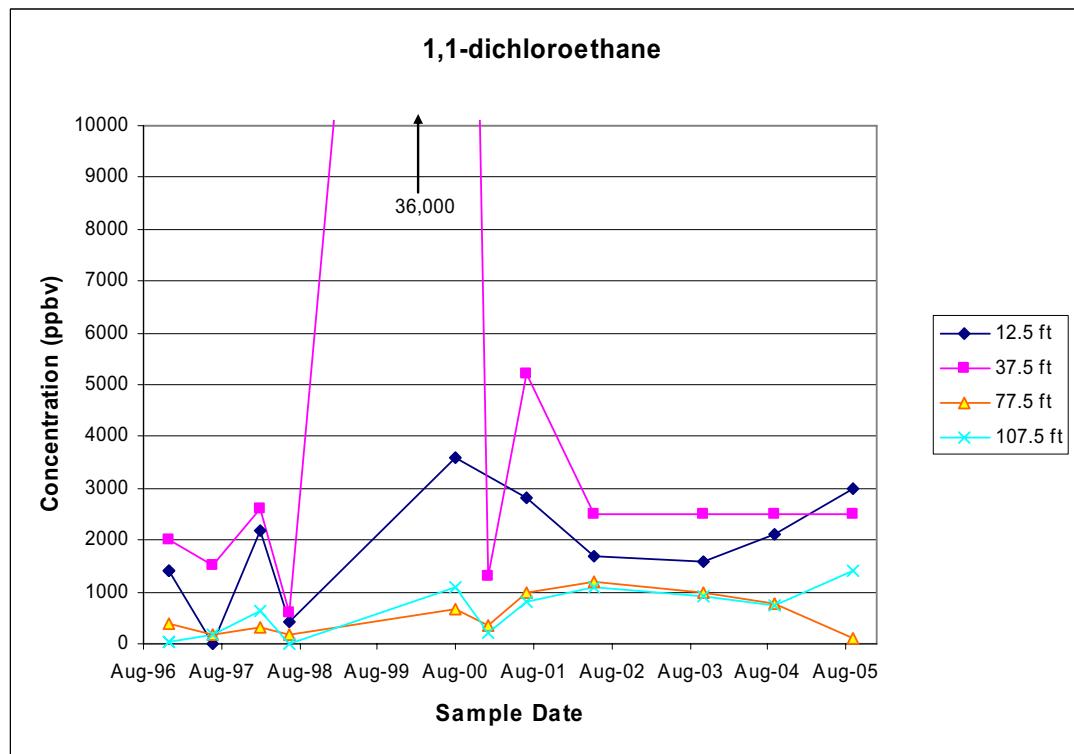


Figure 3-3b. Vapor trends for 1,1-dichloroethane in Well GSP2-2 (CFA-GAS-V-006) at Landfill II.

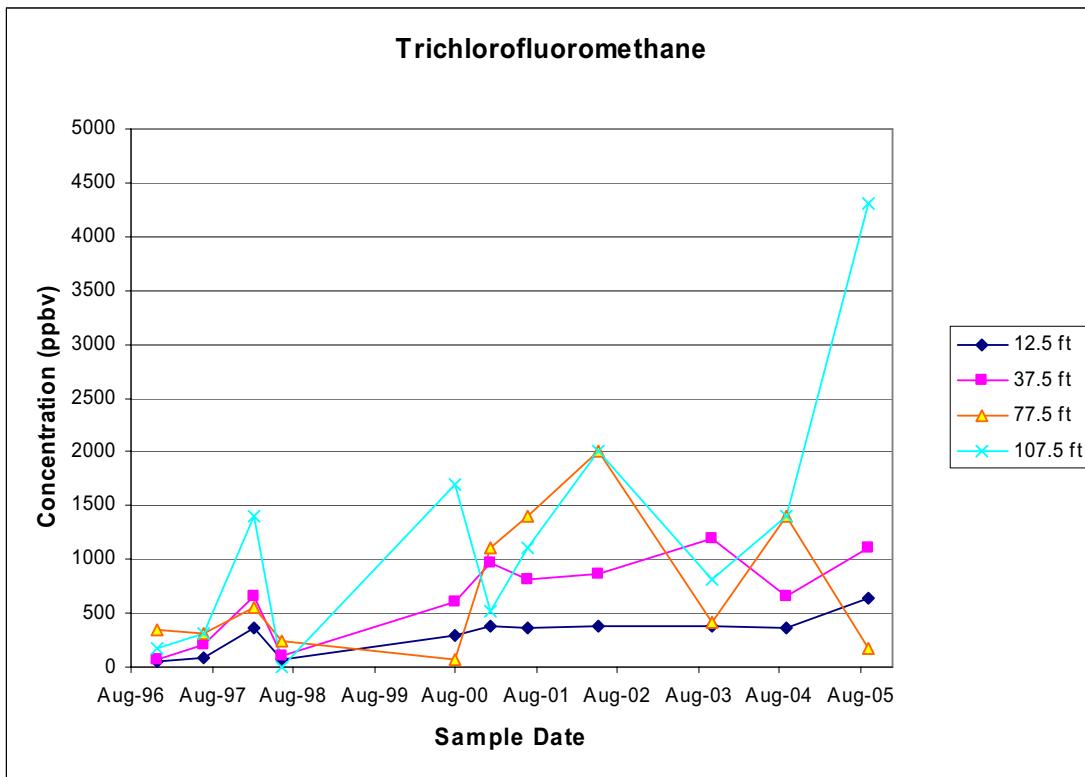


Figure 3-3c. Vapor trends for trichlorofluoromethane in Well GSP2-2 (CFA-GAS-V-006) at Landfill II.

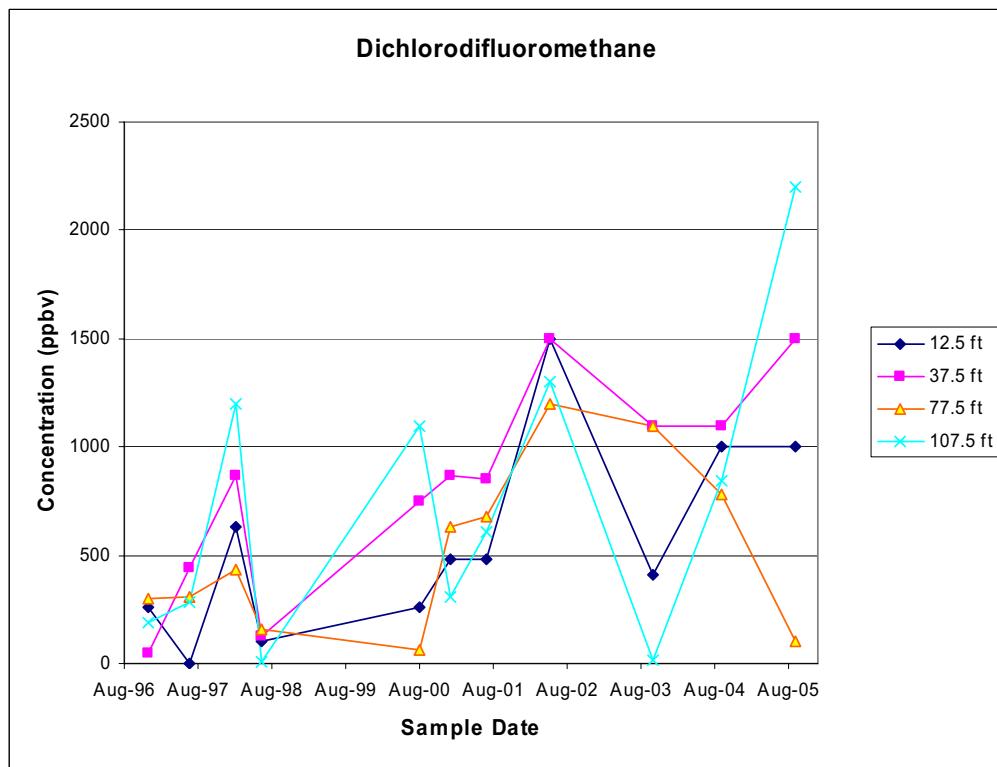


Figure 3-3d. Vapor trends for dichlorodifluoromethane in Well GSP2-2 (CFA-GAS-V-006) at Landfill II.

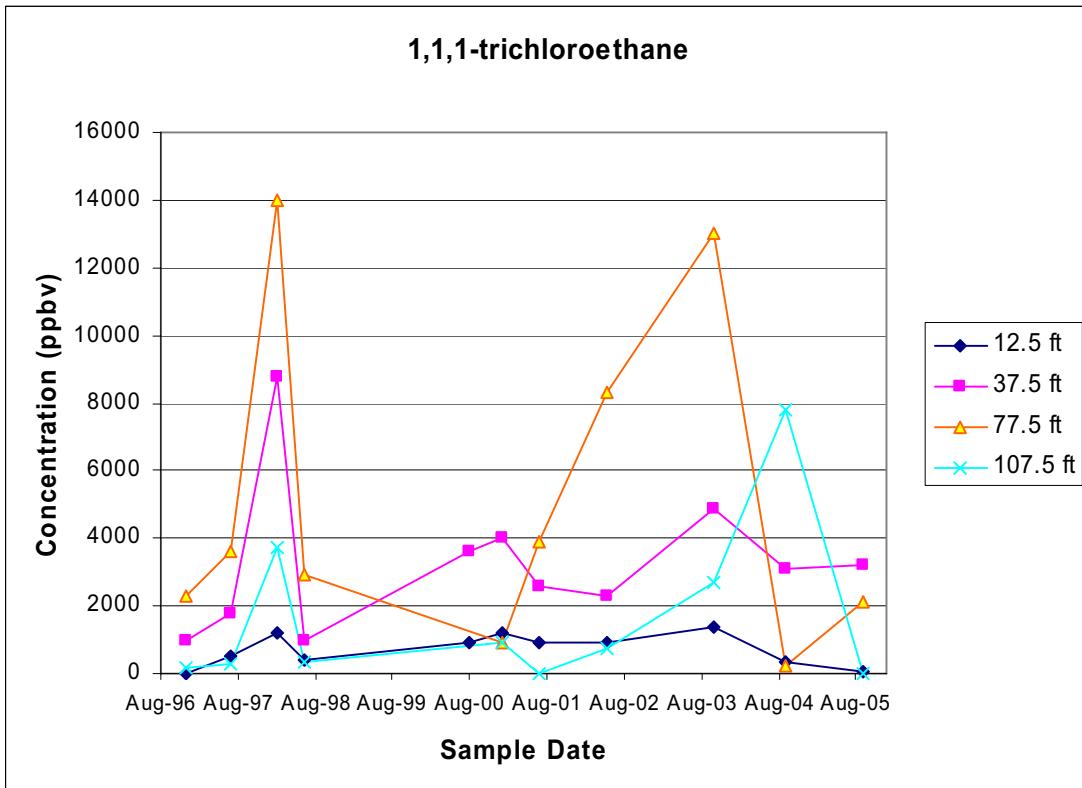


Figure 3-4a. Vapor trends for 1,1,1-trichloroethane in Well GSP3-1 (CFA-GAS-007) near Landfill III.

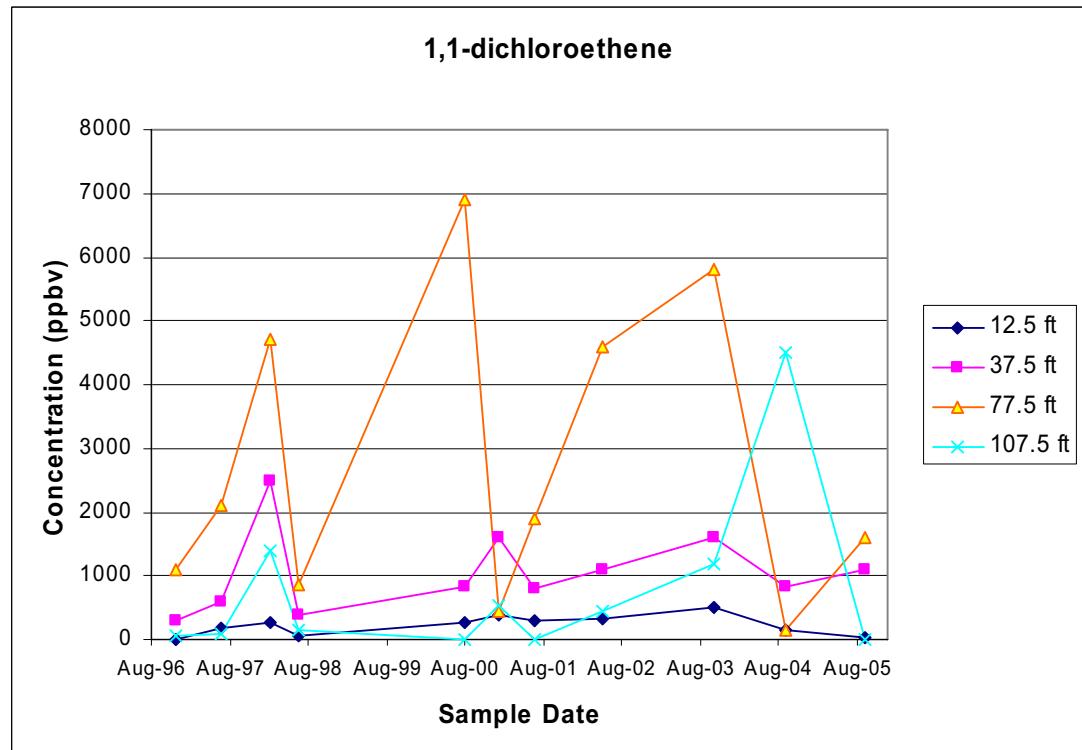


Figure 3-4b. Vapor trends for 1,1-dichloroethene in Well GSP3-1 (CFA-GAS-007) near Landfill III.

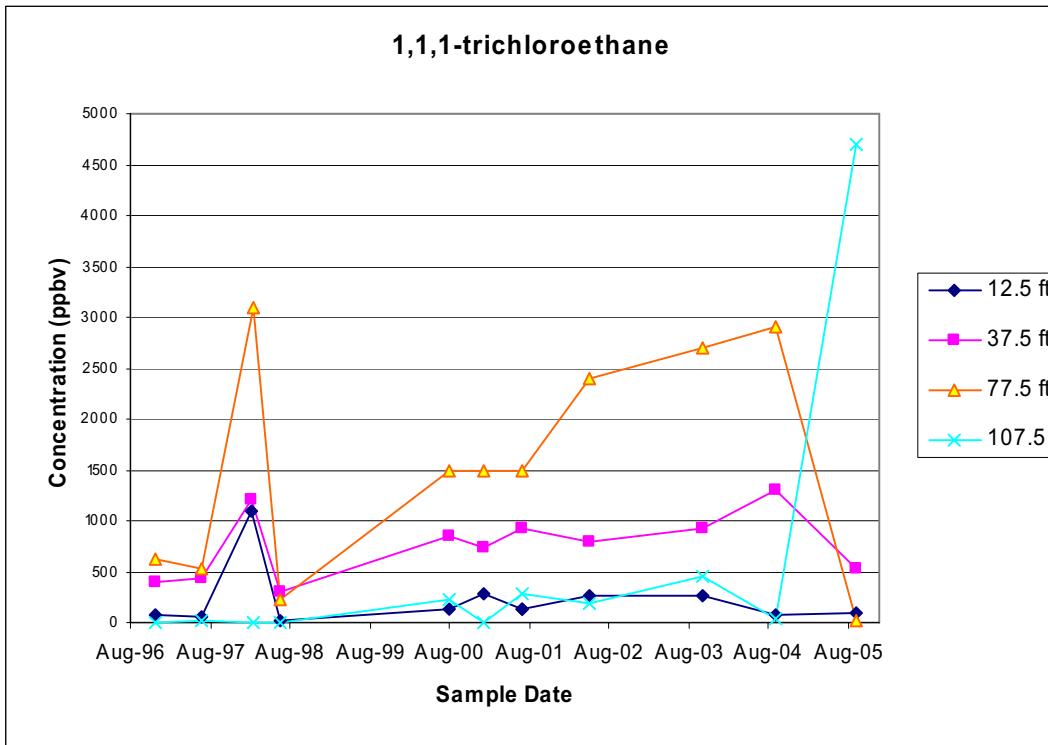


Figure 3-5a. Concentration trends for 1,1,1-trichloroethane in Well GSP3-2 (CFA-GAS-V-008) near Landfill III.

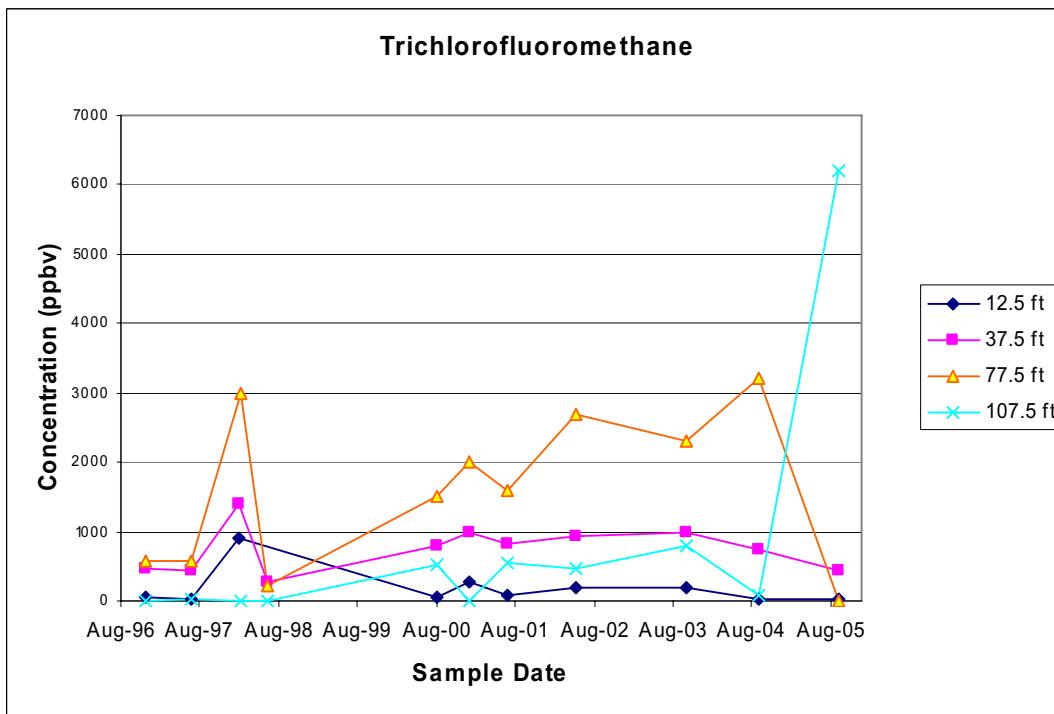


Figure 3-5b. Concentration trends for trichlorofluoromethane in Well GSP3-2 (CFA-GAS-V-008) near Landfill III.

In addition to the above gas sampling wells, gas sampling ports were installed in Wells CFA-1931 and CFA-1932. The analytes with detections are summarized in Table 3-2. The most notable detection was trichloroethene in CFA-1931 at a concentration of 340 ppbv at a depth of 470 to 475 ft. The significance is uncertain since this was the first time this well was sampled and trichloroethene was not detected in any of the groundwater samples and was approximately an order of magnitude lower in the sample collected at 295 to 300 ft.

3.1 Determination of Criteria for Additional Vapor-Related Actions

In the previous WAG 4 annual monitoring report and five-year review, it was proposed that the need for vadose zone vapor modeling or other actions would be based on “trigger” soil-gas concentrations. The “trigger” concentrations are based on (a) soil-gas data from near the water table collected at WAG 7, (b) deep soil-gas data from the new CFA landfill wells, and (c) Henry’s law calculations.

The potential impacts of VOCs in soil gas at the CFA landfills were previously evaluated by comparing deep soil-gas concentrations at the CFA landfills to the preliminary remediation goals (PRGs) calculated for the Subsurface Disposal Area (SDA), which is an INL site with geologic and hydrologic conditions similar to those at the CFA landfills. The PRGs are the estimated maximum soil-gas concentrations that will not cause groundwater concentrations to exceed MCLs. The PRG range for carbon tetrachloride at the SDA is 30 to 200 parts per million by volume (ppmv) at 100 to 200 ft bls (DOE-ID 1994). The MCL for carbon tetrachloride is 5 µg/L, the same as trichloroethene and tetrachloroethene. The MCL for 1,1,1-trichloroethane is 200 µg/L. Given the similar geologic and hydrologic conditions at the sites and the similar nature of the contaminants (chlorinated solvents), it is reasonable to assume that the PRG calculated for the SDA can be applied at the CFA landfills to make rough approximations.

The maximum tetrachloroethene and trichloroethene concentrations measured in 2005 in the soil gas in the GSP wells at the CFA landfills were 0.45 and 3.1 ppmv, respectively. These concentrations are much lower than the PRG range calculated for carbon tetrachloride at the SDA for a similar depth. The maximum 1,1,1-trichloroethane concentration measured in the GSP wells is 7.8 ppmv. Although this value is closer to the PRG range calculated for the SDA, the MCL for 1,1,1-trichloroethane is 40 times higher than the MCL for tetrachloroethene, trichloroethene, and carbon tetrachloride. Given these comparisons, it is highly unlikely that the contamination in the vicinity of the GSP wells could adversely impact the SRPA.

The qualitative approach described above is now supplemented with calculated “trigger” values determined based on newly collected data and Henry’s law calculations. The equilibrium vapor-groundwater values predicted by Henry’s law likely will not be achieved, because vertical mixing is limited or extremely slow, due to the relatively undisturbed groundwater surface resulting from laminar flow. The relatively fast groundwater flow in the SRPA and limited recharge from the vadose zone also may limit the achievement of Henry’s law equilibrium values. The empirical relationship of the vapor concentrations to the actual groundwater concentrations at the Radioactive Waste Management Complex (RWMC) is used to adjust the Henry’s law values to reflect non-equilibrium conditions and provide an analogy to observed values at the INL.

The compounds selected to calculate trigger values are trichloroethene, tetrachloroethene, carbon tetrachloride, 1,1,1-trichloroethane, and chloroform. These compounds were selected because they have MCLs and occur as soil gas contaminants. A trigger value was not calculated for the compounds 1,1-dichloroethane, trichlorofluoromethane (F-11), dichlorodifluoromethane (F-12), 1,2-dichloro-1,1,2 trifluoroethane, 1,1,2 trichlorotrifluoroethane (F-113), and dichlorofluoromethane because these compounds do not have MCLs.

Calculated values for vapor in equilibration with groundwater at the groundwater MCL based on Henry's law for trichloroethene, tetrachloroethene, carbon tetrachloride, 1,1,1-trichloroethane, and chloroform are shown in Table 3-3. None of the soil gas samples from depths of 255 to 475 ft is above the threshold predicted by Henry's law for groundwater to exceed an MCL (Tables 3-2 and 3-3). The lack of VOC detections in groundwater also supports the premise that soil gas concentrations are not a significant influence on groundwater.

Table 3-3. Calculated equilibrium vapor concentrations based on Henry's law for "trigger" soil-gas analytes in equilibrium with groundwater at 10°C and 25°C.

Compound	Henry's Constant Kh-Dimensionless		MCL	Vapor Concentration at MCL (25°C)		Vapor Concentration at MCL (10°C)		Ratio Vapor/Groundwater ppbv/ug/L ^c
	25°C ^a	10°C ^b		ug/L	ug/L	ppbv	ug/L	
1,1,1-TCA	1.13	0.284	200	226	41,421	56.8	10,410	52
Trichloroethene	0.397	0.139	5	1.985	369	0.695	129	26
Tetrachloroethene	0.928	0.256	5	4.64	684	1.28	189	38
Carbon Tetrachloride	0.807	0.448	5	4.035	641	2.24	356	71
Chloroform	0.153	0.0704	100	15.3	3,134	7.04	1,442	14

a. Values from Davis (1997).
b. Values from Dewulf, Drijvers, and Langenhove (1995).
c. Equilibrium ratio at 10°C for the MCL.
MCL = maximum contaminant level

Vapor contamination of the aquifer occurs at the RWMC and the empirical relationship between carbon tetrachloride vapor and groundwater concentrations is used as a guide to evaluate the potential influence of vapors on groundwater at CFA. The values for carbon tetrachloride in deep sampling ports and groundwater at the RWMC for the 2002 to 2005 period are summarized in Table 3-4. The data for the RWMC area indicate that the average vapor/groundwater ratios are 3 to 79 times higher than the values predicted by Henry's law (Table 3-5). The average measured deep soil-gas/groundwater concentration ratio is 21 times higher than that predicted by Henry's law. If the highest and lowest ratios are excluded, then the average measured deep soil gas/groundwater concentration ratio drops to 13.6 times the Henry's law value (Table 3-5).

Table 3-4. Measured vapor and groundwater carbon tetrachloride concentrations for the RWMC area.

Vapor Sampling					Groundwater Sampling					LF	VF
Date	Well	Depth (ft)	Port	Concentration (ppmv)	Date	Well	Depth (ft)	Concentration (ug/L)			
12/3/02	M14S	581	1	0.0269	11/05/02	M14S	634.6	1.2			
3/11/03	M14S	581	1	0.479	02/03/03	M14S	634.6	1	U		
6/2/03	M14S	581	1	0	04/28/03	M14S	634.6	1		J	
9/2/03	M14S	581	1	0.15	08/05/03	M14S	634	1	U		
12/4/03	M14S	581	1	0.835	12/01/03	M14S	634.6	0.95	J	J	
3/4/04	M14S	581	1	1.15	01/26/04	M14S	634.6	0.86	J	J	
6/10/04	M14S	581	1	0.125	04/26/04	M14S	634.6	0.9	J	J	
12/8/04	M14S	581	1	0	11/30/04	M14S	634.6	0.85	J	J	

Table 3-4. (continued).

Vapor Sampling					Groundwater Sampling					
Date	Well	Depth (ft)	Port	Concentration (ppmv)	Date	Well	Depth (ft)	Concentration (ug/L)	LF	VF
6/1/05	M14S	581	1	0.353	04/27/05	M14S	634.6	0.64	J	J
12/20/05	M14S	581	1	0.499	11/09/05	M14S	634.6	0.78	J	
		average		0.36			average	0.92		
6/2/03	M16S	548	1	1.59	04/30/03	M16S	613	5	J	
9/2/03	M16S	548	1	1.07	08/04/03	M16S	653	7	J	
12/4/03	M16S	548	1	1.32	12/01/03	M16S	613	4.3		
3/4/04	M16S	548	1	1.68	01/21/04	M16S	613	4.4		
6/15/04	M16S	548	1	0.859	05/04/04	M16S	613	4.2		
12/8/04	M16S	548	1	1.01	11/30/04	M16S	613	4.2		
6/1/05	M16S	548	1	0.832	05/04/05	M16S	613	3.1	J	
12/8/05	M16S	548	1	0.488	11/09/05	M16S	613	4.7		
		average		1.11			average	4.61		
2/5/03	M17S	573	1	1.46	02/04/03	M17S	628.5	2		
5/5/03	M17S	573	1	4.54	05/07/03	M17S	628.5	2		
8/5/03	M17S	573	1	8.71	08/06/03	M17S	628.5	1	U	
12/2/03	M17S	573	1	16	12/03/03	M17S	628.5	1.8		
2/4/04	M17S	573	1	26.7	01/21/04	M17S	628.5	1.7		
9/30/04	M17S	573	1	2.96	10/29/04	M17S	628.5	1.5		
10/6/04	M17S	573	1	8.11	10/29/04	M17S	628.5	1.6		
5/12/05	M17S	573	1	5.95	05/05/05	M17S	628.5	1.1	J	
6/2/05	M17S	573	1	3.32	05/05/05	M17S	628.5	1	J	
		average		8.64			average	1.52		
1/8/03	M1S	566	1	0.571	04/27/04	M1S	638	1	U	
2/5/03	M1S	566	1	0.642	12/01/04	M1S	638	1	U	
3/11/03	M1S	566	1	0.0697	04/28/05	M1S	638	1	U	
3/11/03	M1S	566	1	0.00941	03/21/00	M1S	631	1	U	
4/1/03	M1S	566	1	0.254	02/05/03	M1S	638	1	U	
5/5/03	M1S	566	1	0.42	05/06/03	M1S	638	1	U	
6/2/03	M1S	566	1	0.0667	08/06/03	M1S	638	1	U	
7/7/03	M1S	566	1	0.808	12/02/03	M1S	638	1	U	
8/4/03	M1S	566	1	1.16	01/27/04	M1S	638	1	U	
9/2/03	M1S	566	1	0.736	07/11/00	M1SA	631	1	U	
10/7/03	M1S	566	1	4.05	09/14/00	M1SA	631	1	U	
11/3/03	M1S	566	1	0.891	10/24/00	M1SA	631	1	U	
12/3/03	M1S	566	1	1.57	01/16/01	M1SA	631	1	U	
1/12/04	M1S	566	1	1.72	04/16/01	M1SA	631	1	U	J
2/2/04	M1S	566	1	1.21	09/25/01	M1SA	631	1	U	
3/2/04	M1S	566	1	1.4	12/05/01	M1SA	631	1	U	

Table 3-4. (continued).

Vapor Sampling					Groundwater Sampling					
Date	Well	Depth (ft)	Port	Concentration (ppmv)	Date	Well	Depth (ft)	Concentration (ug/L)	LF	VF
4/8/04	M1S	566	1	1.16	02/19/02	M1SA	631	1	U	
5/4/04	M1S	566	1	1.09	05/15/02	M1SA	638	1	U	
6/15/04	M1S	566	1	0.848	09/12/02	M1SA	638	1	U	
7/8/04	M1S	566	1	0.79	11/05/02	M1SA	638	1	U	
		average		0.97		average		1.00		
2/5/03	M3S	505	2	5.12	02/05/03	M3S	632.8	1	U	
5/5/03	M3S	505	2	5.2	05/06/03	M3S	632.8	3		
8/4/03	M3S	505	2	5.53	08/06/03	M3S	632.8	3		J
12/3/03	M3S	505	2	4.8	12/02/03	M3S	632.8	2.1		
2/2/04	M3S	505	2	4.83	01/27/04	M3S	643.1	2.2		
5/4/04	M3S	505	2	5.29	04/27/04	M3S	632.8	2.5		
12/8/04	M3S	505	2	2.58	12/01/04	M3S	632.8	2.7		
4/7/05	M3S	505	2	10.7	04/28/05	M3S	632.8	2.5		J
		average		5.51		average		2.38		
3/11/03	M6S	588	1	1.56	02/03/03	M6S	668	2		
6/2/03	M6S	588	1	1.64	04/28/03	M6S	668	2		J
9/2/03	M6S	588	1	1.64	08/04/03	M6S	668	4		J
12/4/03	M6S	588	1	2.1	12/01/03	M6S	668	2.1		
3/2/04	M6S	588	1	2.17	01/20/04	M6S	668	2		
6/10/04	M6S	588	1	2.03	05/03/04	M6S	668	2.8		
12/8/04	M6S	588	1	2.23	11/23/04	M6S	668	2		
3/8/05	M6S	588	1	1.95	04/27/05	M6S	668	2		J
		average		1.92		average		2.36		
3/11/03	M7S	547	1	2.28	02/03/03	M7S	628	5		
6/2/03	M7S	547	1	2.73	04/29/03	M7S	628	6		J
9/2/03	M7S	547	1	1.97	08/05/03	M7S	628	8		
12/4/03	M7S	547	1	2.54	12/01/03	M7S	628	4.5		
3/4/04	M7S	547	1	1.23	01/20/04	M7S	628	5.2		
6/15/04	M7S	547	1	6.98	05/05/04	M7S	628	6.1		
9/8/04	M7S	547	1	2.49	11/23/04	M7S	628	6.5		
12/8/04	M7S	547	1	0.408	11/23/04	M7S	628	6.4		
3/8/05	M7S	547	1	0.793	05/03/05	M7S	628	5		J
6/1/05	M7S	547	1	0.366	05/03/05	M7S	628	4.6		J
9/6/05	M7S	547	1	0.234	11/17/05	M7S	628	7.8		
12/20/05	M7S	547	1	0.422	11/17/05	M7S	628	6.2		
		average		1.87		average		5.94		

Table 3-5. Summary of measured vapor and groundwater ratios for carbon tetrachloride at the RWMC area and comparison to ratio calculated using Henry's law.

Well	Average Vapor Concentration (ppbv)	Average Groundwater Concentration (ug/L)	Observed Vapor/Water (ppbv/ug/L) ^a	Ratio Observed/Calculated ^b
M7S	1870	5.42	345	4.8
M6S	1915	2.36	811	11.4
M1S	973	1.00	973	13.7
M3S	5506	2.38	2318	32.6
M16S	1106	4.61	240	3.4
M17S	8639	1.52	5675	79.7
M14S	362	0.92	394	5.5
		Average	1537	21.6
		Average (excluding highest and lowest values)		13.6

a. Ratio of observed concentrations at the RWMC wells.

b. Ratio of observed concentration at the RWMC to ratio calculated based on Henry's law. A "4.8" value is 4.8 times the value predicted based on Henry's law.

3.2 Proposed Criteria to Initiate Additional Vapor-Related Actions

The proposed "trigger" vapor concentrations are based on the Henry's law value multiplied by the empirical relationship observed for carbon tetrachloride partitioning between vapor and groundwater at the RWMC. The observed carbon tetrachloride vapor-groundwater data provide a basis to adjust the theoretically based Henry's law equilibrium values. The observed vapor-groundwater ratios versus Henry's law ratio may be different for other VOCs, such as trichloroethene (TCE) and tetrachloroethene (PCE). The trigger values proposed as criteria for initiating additional actions are given in Table 3-6. These trigger concentrations have the following conditions:

1. Vapor concentrations exceeding five times the calculated Henry's law value in the 255 to 475-ft gas sampling ports; or 13 times the Henry's law value in the 107.5-ft sampling depth; and
2. Vapor concentrations need to exceed the "trigger" level in two consecutive sampling events in order to avoid lab errors triggering additional actions; and
3. In addition to the above criteria, the soil gas contaminant that exceeds a "trigger" concentration must also be detected in groundwater for two consecutive years.

Table 3-6. Summary of proposed vapor “trigger” concentrations and comparisons to maximum measured vapor concentrations.

Compound	Concentration from Henry's Law (ppbv)	Proposed “Trigger” Values		Maximum Concentration 2005	
		107.5 ft ^a	255 to 475 ft ^b	107.5 ft (ppbv)	255 to 475 ft (ppbv)
1,1,1-TCA	10,410	141,580	52,051	4,700	96
Trichloroethene	129	1,759	647	200	340
Tetrachloroethene	189	2,567	944	400	64
Carbon tetrachloride	356	4,842	1,780	51	ND
Chloroform	1,442	19,610	7,209	28	38

a. Henry's law vapor value multiplied by the average ratio (13) measured at the RWMC.
 b. Henry's law vapor value multiplied by 5 (value for 3 wells) measured at the RWMC.
 ppbv = parts per billion by volume
 RWMC = Radioactive Waste Management Complex

If additional actions are determined to be needed as a result of vapor concentrations exceeding a trigger level, then actions that will be considered include: more frequent sampling vapor and groundwater sampling, trend analysis, and installation of additional vapor sampling locations. Vapor modeling may be considered, but the limitations and uncertainties associated with vapor modeling should be considered. Assumptions must be made regarding source-term mass, lateral vapor migration, flux out of the cover into the atmosphere, the distribution of contaminants with depth in soil moisture and vapor, depth of mixing in the groundwater, permeabilities in the vadose zone, and the size of the contaminated vapor footprint interacting with the aquifer. The great number of uncertainties associated vadose zone modeling will make the creation of a meaningful vapor transport model difficult. Consequently, modeling is not recommended as a first action.

4. MOISTURE MONITORING RESULTS

The overall objective of moisture monitoring at the CFA landfills is to document the effectiveness of the landfill covers in minimizing infiltration into and through the landfill wastes as compared to background or natural conditions (INEEL 2003a). Infiltration was estimated using moisture measurements. Moisture content was measured via TDR and neutron probe instruments. The locations of the four vertical TDR systems and the five NATs installed at CFA Landfills II and III are shown in Figure 3-1. The two vertical TDR arrays located on Landfill II are near NAT LF2-07. Neutron-probe access tube LF2-07 is located on Landfill II, and LF2-03 is located on the edge of Landfill II. LF2-04 is located near Landfill II and is used for monitoring infiltration and recharge in native soil or background conditions. The two vertical TDRs on Landfill III are installed through the cover near NAT LF3-05. NAT LF3-03 is located on the edge of Landfill III. The raw data and graphs of the moisture content data are presented in Appendix B.

The terms *infiltration*, *recharge*, and *drainage* are used throughout this section and are defined as follows. Water that moves into the soil is defined as *infiltration*. Water that continues to move downward beyond the evapotranspiration (ET) depth and out of the soil profile is termed *recharge*. Infiltration and recharge are represented by an increase in water storage within a system. In addition to recharge, ET is a large contributor to decreasing storage in near-surface soils, moving water upward and out of the soil. The term *drainage* refers to water movement out of a unit thickness of soil or a decrease in soil moisture but does not indicate the direction of movement. A detailed description of the calculations used to estimate infiltration, recharge, and drainage is provided in Appendix B.

4.1 Neutron-Probe Moisture Monitoring Results

Because of problems with the neutron probe, infiltration, recharge, and drainage calculations for the five NAT locations could not be performed for Fiscal Year 2005. The problems with the neutron probe began in late October 2004 when the electrical connection between the probe and the main unit was damaged. Because of this malfunction, readings were not taken in November or December 2004. The cable was sent to the manufacturer's representative for repair. Neutron probe readings were performed in January, February, and March of 2005. The electrical connection was again found to be damaged in late March 2005. The cable was sent to the manufacturer's representative for repair. When measurements were resumed in June 2005, it was noted that the spacers that mark the depth along the cable were not at the same positions as the previously positioned spacers. Although the cable appeared to be functioning correctly, the probe readings did not match the previous readings. Thus, probe readings taken since June 2005 are a separate data set from the previous measurements.

4.2 TDR Monitoring Results

The calculated infiltration for the time-domain reflectometer locations ranges from 1.16 to 7.53 in. (Table 4-1). Similarly, drainage or losses in storage for the time-domain reflectometer arrays range from 0.62 to 7.53 in. of water (Appendix B). The measured precipitation at the CFA National Oceanic and Atmospheric Administration (NOAA) weather station was 2.35 in. for winter precipitation and 4.36 in. for April–May precipitation. The high calculated infiltration values from the TDRs relative to the measured precipitation could be due to lack of probe calibration, changes in the soil dielectric constant resulting from freeze/thaw of soil water, or physical nonconformities in the subsurface, such as water filling void pockets next to the probe.

Table 4-1. Summary of landfill cover neutron-probe access tubes and time-domain reflectometry monitoring results for October 2004 to October 2005.

	NAT Locations				TDR Locations				
	LF2-03	LF2-04	LF2-07	LF3-03	LF3-05	LF3-east	LF3-west	LF2-north	LF2-south
Spring 2005 infiltration event (in. of water)									
Infiltration	—	—	—	—	—	4.34	7.53	5.30	1.16
Recharge ^a	—	—	—	—	<0.25	<0.25	0.44	0.44	0.65
Oct. 2004 to Oct. 2005 yearly drainage (in. of water)									
Total drainage	—	—	—	—	—	—	—	—	—
Within ET zone ^b	—	—	—	—	—	—	—	—	—
Change in storage from Oct. 2004 to Oct. 2005 (in. of water)									
Total	—	—	—	—	—	-0.92	0.37	0.56	0.14
Within cap	—	—	—	—	—	-0.24	0.35	0.14	-0.13
Within ET zone	—	—	—	—	—	-0.52	0.45	0.65	0.01
Below ET zone ^b	—	—	—	—	—	-0.40	-0.08	-0.09	0.13

a. The amount of recharge is estimated to be the increase in moisture content below the ET depth.

b. The ET depth is assumed to be 3–4 ft for the NATs and 4 ft for the TDRs. The small difference in ET depth, 3–4 ft for the NATs versus 4 ft for the TDR, is due to the different sampling intervals (1 ft for the NAT versus 1/2 ft for the TDR).

ET = evapotranspiration

NAT = neutron-probe access tube

TDR = time-domain reflectometer.

Recharge was evaluated by examining the changes in moisture content within the intervals monitored by the TDRs (Appendix B). Precipitation events other than in the mid-March to May spring infiltration event impacted only the 0- to 6-in. depth interval. At Landfills II and III, from depths of 4 to 8 ft or below the estimated ET depth of 3 to 4 ft, there were small changes in soil moisture content. The 3–4 ft ET depth used for the TDRs was determined based on NAT data. In addition, this depth has been kept consistent to provide a data comparability over time. Actual ET depths at the INL and on the covers could vary depending on local soil conditions. All four TDR locations showed at least one segment with moisture content increases greater than 2.5 percent or a change of 0.025 in moisture content below a depth of 4 ft, but it appears that ET consumed most of the infiltrated water for the spring of 2005. The recharge estimates in Table 4-1 for the TDRs are probably biased high, based on previous comparisons of uncalibrated TDR data with calibrated NAT data.

An analysis of the change in water storage indicated small changes for the four TDRs within the landfill cap, the ET zone, and below the ET zone. There were increases in storage over the monitoring period for the 0- to 2-ft depth for the TDRs LF2-north and LF3-west and decreases at LF2-south and LF3-east (Table 4-1). One of the TDRs at Landfill III (LF3-west) showed a loss (-0.92 in.) in storage for the 0- to 8-ft depth interval over the monitoring period, while the other TDR (LF3-west) showed a gain of 0.35 inches. The two TDRs at Landfill II showed gains in water storage of 0.14 and 0.56 in. for LF2-south and LF2-north, respectively, for the 0- to 8-ft interval. For the 4 to 8-ft depth interval or the interval below the estimated ET depth of 4 ft, there was a loss in storage at both of the Landfill III TDR arrays. The TDRs at Landfill II showed a slight loss at LF2-north of -0.09 in. and a slight gain of 0.13 in. for the depth interval of 4 to 8 ft.

4.3 Summary of Landfill Cover Modeling Results

The CFA landfill covers were designed using the HELP model to reduce infiltration through the CFA landfills and limit the advective transport of contaminants from waste to the underlying aquifer. Since the design of the CFA landfill covers, questions have arisen regarding the use of the HELP model to evaluate landfill covers in arid climates (Meyer et al. 1996). In order to evaluate whether the CFA landfill covers are performing as intended, a numerical modeling study was conducted. The HYDRUS 1D code was used for the numerical modeling simulations.

The primary objective of the landfill cover modeling was to quantify recharge rates through the landfill covers using a numerical model of the infiltration process and compare results to a background location. This was accomplished by simulating infiltration patterns with a one-dimensional vadose zone model and calibrating the model to transient observed soil moisture. Modeling studies were conducted for NAT data from Stations LF3-05 (Landfill III), LF2-04 (background) and LF2-07 (Landfill II). The NAT data were used because these data are calibrated to in situ conditions, while the TDR instruments were not calibrated. A complete description of the model inputs and simulations is included in Appendix C.

At LF3-05, seasonal infiltration pulses were effectively removed by subsequent evaporation. Net recharge was nearly negligible and transpiration removed the small flux that did penetrate the surface. Water content variations were more rapidly damped with depth, compared to the NAT locations simulated for Landfill II.

Calculated average recharge rates at LF2-04 and LF2-07 were approximately 7 and 3 cm per year, respectively. Although greater than at LF3-05, the simulated recharge at LF2-07 is less than that at LF2-04 (the background location between the landfills). The reduction in recharge at LF2-07, compared to the background location, suggests that the cover on Landfill II significantly enhances evapotranspiration over natural conditions. Note that the model was calibrated using an anomalously high year for LF2-07. The effect is that the model is biased high for recharge.

5. SUMMARY

Nitrate and chromium are the only constituents found to exceed their groundwater MCLs during the 2005 CFA landfill monitoring effort. Nitrate exceeded its MCL in two wells, CFA-MON-A-002 and CFA-MON-A-003. Although nitrate concentrations increased sharply in CFA-MON-A-003 in the 2005 sampling event, nitrate concentrations in CFA-MON-A-002 and -003 had been relatively consistent since monitoring started in 1995. The occurrence of chromium above its MCL in LF3-09 could be due to suspended particulates.

The most common VOCs detected in the soil-gas samples were of 1,1,1-trichloroethane, 1,1-dichloroethane, 1,1-dichloroethene, trichloroethene, dichlorodifluoromethane, and trichlorofluoromethane. The halogenated compounds are common solvents, constituents found in solvents, or freons. The VOC that occurred at the highest concentration in the 2005 vapor sampling was trifluorochloromethane at 6,200 ppbv. In most previous years, 1,1,1-trichloroethane occurred at the highest concentration in soil gas samples. In 2005, the highest 1,1,1-trichloroethane concentration was 4,700 parts per billion by volume (ppbv) in GSP3-2 at a nominal depth of 107.5 ft. Other solvents detected in the soil gas samples included F-113, carbon tetrachloride, cis-1,2-dichloroethene, and tetrachloroethene. None of these VOCs were detected in the groundwater.

The TDR results for 2005 indicated a slight recharge for CFA Landfill II of 0.44 to 0.65 in. and less than 0.25 in. for Landfill III.

In order to evaluate whether the CFA landfill covers are performing as intended, a numerical modeling study was conducted. The primary objective of the landfill cover modeling was to quantify recharge rates through the landfill covers and compare results to a background location. The results indicated minimal recharge at Landfill III and considerably less than the background at Landfill II.

6. RECOMMENDATIONS

The following are recommendations to improve the monitoring system for the CFA landfills:

- Because groundwater flow directions and gradients do not appear to be varying significantly, it is recommended that the frequency of water-level measurements be reduced to 3 years rather than every year. The rationale for reducing the frequency is that water level measurements were performed monthly for a year (2000–2001) and then have been performed annually through 2005, with flow directions and gradients varying slightly over this period. Since consistency has been shown, it is sensible to reduce the frequency of measurements.
- Based on the landfill cover modeling and problems with the neutron probe and TDR measurements, the recommendation is made to discontinue moisture monitoring at the CFA landfills.
- It is recommended that both filtered and unfiltered metals samples be collected in 2006. This is recommended because the decrease in water-levels could and probably has lead to an increase in suspended solids in the samples.

The recommendations made in this section are scheduled to be addressed in the 2006 annual monitoring report.

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Appendix A

Analytical Results

Appendix A

Analytical Results

This appendix presents the groundwater and soil-gas analytical results derived from monitoring conducted at Central Facilities Area Landfills I, II, and III. Sampling and analysis of groundwater occurred in October 2005. Soil gas sampling was conducted on September 28, 2005. The analytes and analytical methods are summarized in Table A-1, while the complete set of groundwater and soil gas data is provided in Tables A-2 and A-3, as well as on CD-ROM attached to the inside back cover of this report. Note that the list of soil gas compounds having presumptive evidence that the compound is present (NJ flagged) is larger than previous sampling events. The list of compounds detected (NJ flagged) is usually laboratory specific depending on the method and does not imply that these compounds recently appeared in the soil gas samples. In Tables A-2 and A-3 and on the CD, sample and duplicate samples are denoted by the number in front of the two-character analytical code at the end of the field sample number with a “1” referring to the sample and “2” a referring to a duplicate. For example, 4GW06601VA and 4GM06602VA refer to the sample and duplicate, respectively, for volatile organic compounds at CFA-1932.

Table A-1. Analytes and method codes.

Compound	Method Code	Method Description
Chloride	E300	Inorganic Anions by Ion Chromatography
Fluoride	E300	Inorganic Anions by Ion Chromatography
Sulfate	E300	Inorganic Anions by Ion Chromatography
Alkalinity, Total as CaCO ₃	E310.1	Alkalinity, Total (as Carbonate)
Nitrogen, Nitrate/Nitrite	E353.1	Nitrogen, Nitrate-Nitrite
Antimony	SW6020	Inductively Coupled Plasma - Mass Spectrometry
Arsenic	SW6020	Inductively Coupled Plasma - Mass Spectrometry
Barium	SW6020	Inductively Coupled Plasma - Mass Spectrometry
Beryllium	SW6020	Inductively Coupled Plasma - Mass Spectrometry
Chromium	SW6020	Inductively Coupled Plasma - Mass Spectrometry
Cobalt	SW6020	Inductively Coupled Plasma - Mass Spectrometry
Copper	SW6020	Inductively Coupled Plasma - Mass Spectrometry
Nickel	SW6020	Inductively Coupled Plasma - Mass Spectrometry
Selenium	SW6020	Inductively Coupled Plasma - Mass Spectrometry
Silver	SW6020	Inductively Coupled Plasma - Mass Spectrometry
Thallium	SW6020	Inductively Coupled Plasma - Mass Spectrometry
Tin	SW6020	Inductively Coupled Plasma - Mass Spectrometry
Vanadium	SW6020	Inductively Coupled Plasma - Mass Spectrometry
Zinc	SW6020	Inductively Coupled Plasma - Mass Spectrometry
Mercury	SW7470A	Mercury in Liquid Waste (Manual Cold-Vapor Technique)
Methane	SW8015	Non-Halogenated Volatile Organics
VOCs	SW8260B	Volatile Organic Compounds by GC/MS

The data qualifier flags used in this appendix are a consolidation of laboratory- and validation-assigned flags and are defined as follows:

Organics

- B – the analyte was detected in the associated laboratory method blank as well as in the sample.
- D – the sample result is from a dilution.
- U – the analyte was analyzed for, but it was not detected.
- UJ – the analyte was analyzed for, but it was not detected. The associated value is an estimate and might be inaccurate or imprecise.
- J – the analyte was detected, but the associated values are an estimate and might be inaccurate or imprecise.
- N – there is presumptive evidence that a compound is present.
- NJ or JN – there is presumptive evidence that a compound is present and the associated values are estimates.
- R – the accuracy of the data is so questionable that it is recommended that the data not be used. The “R” flag overrides all other applicable flags.

Inorganics

- B – the result is less than the contract-required reporting limit but greater than or equal to the instrument detection limit.
- E – the reported value was estimated because of the presence of interference.
- N – the spiked sample recovery was outside control limits.
- U – the analyte was not detected.
- UJ – the analyte was analyzed for, but it was not detected. The associated value is an estimate and might be inaccurate or imprecise.
- R – the accuracy of the data is so questionable that it is recommended that the data not be used. The “R” flag overrides all other applicable flags.

Table A-2. Groundwater data.

Field Sample Number	Location	Compound	Sample Result	Result Qualifier	Validation Flag	Sample Units	L&V Report Number
4GW06501VA	CFA-1931	1,1,1-Trichloroethane	1	U		UG/L	JGJ-007-06
4GW06501VA	CFA-1931	1,1,2,2-Tetrachloroethane	1	U		UG/L	JGJ-007-06
4GW06501VA	CFA-1931	1,1,2-Trichloroethane	1	U		UG/L	JGJ-007-06
4GW06501VA	CFA-1931	1,1-Dichloroethane	1	U		UG/L	JGJ-007-06
4GW06501VA	CFA-1931	1,1-Dichloroethylene	1	U		UG/L	JGJ-007-06
4GW06501VA	CFA-1931	1,2,4-Trichlorobenzene	1	U		UG/L	JGJ-007-06
4GW06501VA	CFA-1931	1,2,4-Trimethylbenzene	1	U		UG/L	JGJ-007-06
4GW06501VA	CFA-1931	1,2-Dibromo-3-chloropropane	1	U		UG/L	JGJ-007-06
4GW06501VA	CFA-1931	1,2-Dibromoethane	1	U		UG/L	JGJ-007-06
4GW06501VA	CFA-1931	1,2-Dichlorobenzene	1	U		UG/L	JGJ-007-06
4GW06501VA	CFA-1931	1,2-Dichloroethane	1	U		UG/L	JGJ-007-06
4GW06501VA	CFA-1931	1,2-Dichloropropane	1	U		UG/L	JGJ-007-06
4GW06501VA	CFA-1931	1,3,5-Trimethylbenzene	1	U		UG/L	JGJ-007-06
4GW06501VA	CFA-1931	1,3-Dichlorobenzene	1	U		UG/L	JGJ-007-06
4GW06501VA	CFA-1931	1,4-Dichlorobenzene	1	U		UG/L	JGJ-007-06
4GW06501VA	CFA-1931	2-Butanone	5	U		UG/L	JGJ-007-06
4GW06501VA	CFA-1931	2-Chloroethyl vinyl ether	5	U		UG/L	JGJ-007-06
4GW06501VA	CFA-1931	2-Hexanone	5	U		UG/L	JGJ-007-06
4GW06501VA	CFA-1931	4-Methyl-2-pentanone	5	U		UG/L	JGJ-007-06
4GW06501VA	CFA-1931	Acetone	5	U		UG/L	JGJ-007-06
4GW06501VA	CFA-1931	Acetonitrile	25	U	R	UG/L	JGJ-007-06
4GW06501A1	CFA-1931	Alkalinity, Total as CaCO ₃	127			MG/L	DNT-017-06
4GW06501C1	CFA-1931	Antimony	0.5	U		UG/L	DNT-015-06
4GW06501C1	CFA-1931	Arsenic	1.5	U		UG/L	DNT-015-06
4GW06501C1	CFA-1931	Barium	116	B		UG/L	DNT-015-06
4GW06501VA	CFA-1931	Benzene	1	U		UG/L	JGJ-007-06
4GW06501C1	CFA-1931	Beryllium	0.1	U		UG/L	DNT-015-06
4GW06501VA	CFA-1931	Bromodichloromethane	1	U		UG/L	JGJ-007-06
4GW06501VA	CFA-1931	Bromoform	1	U		UG/L	JGJ-007-06
4GW06501VA	CFA-1931	Bromomethane	1	U		UG/L	JGJ-007-06
4GW06501C1	CFA-1931	Cadmium	0.1	U		UG/L	DNT-015-06
4GW06501VA	CFA-1931	Carbon disulfide	5	U		UG/L	JGJ-007-06
4GW06501VA	CFA-1931	Carbon tetrachloride	1	U		UG/L	JGJ-007-06
4GW06501F3	CFA-1931	Chloride	104			MG/L	DNT-017-06
4GW06501VA	CFA-1931	Chlorobenzene	1	U		UG/L	JGJ-007-06
4GW06501VA	CFA-1931	Chloroethane	1	U		UG/L	JGJ-007-06
4GW06501VA	CFA-1931	Chloroform	0.73	J	J	UG/L	JGJ-007-06
4GW06501VA	CFA-1931	Chloromethane	1	U		UG/L	JGJ-007-06
4GW06501C1	CFA-1931	Chromium	37	*N	R	UG/L	DNT-015-06
4GW06501VA	CFA-1931	cis-1,2-Dichloroethylene	1	U		UG/L	JGJ-007-06
4GW06501VA	CFA-1931	cis-1,3-Dichloropropylene	1	U		UG/L	JGJ-007-06
4GW06501C1	CFA-1931	Cobalt	1.2	B		UG/L	DNT-015-06
4GW06501C1	CFA-1931	Copper	3.4	*	J	UG/L	DNT-015-06
4GW06501VA	CFA-1931	Cyclohexane	1	U		UG/L	JGJ-007-06
4GW06501VA	CFA-1931	Dibromochloromethane	1	U		UG/L	JGJ-007-06
4GW06501VA	CFA-1931	Dichlorodifluoromethane	1	U		UG/L	JGJ-007-06
4GW06501VA	CFA-1931	Ethylbenzene	1	U		UG/L	JGJ-007-06
4GW06501F3	CFA-1931	Fluoride	0.201	J		MG/L	DNT-017-06
4GW06501VA	CFA-1931	Isopropylbenzene	1	U		UG/L	JGJ-007-06
4GW06501C1	CFA-1931	Lead	0.75	B		UG/L	DNT-015-06
4GW06501C1	CFA-1931	Mercury	0.05	U		UG/L	DNT-015-06
4GW06501VL	CFA-1931	Methane	14	U		UG/L	DMG-213-05
4GW06501VA	CFA-1931	Methyl acetate	5	U		UG/L	JGJ-007-06
4GW06501VA	CFA-1931	Methyl cyclohexane	1	U		UG/L	JGJ-007-06
4GW06501VA	CFA-1931	Methylene Chloride	5	U		UG/L	JGJ-007-06
4GW06501VA	CFA-1931	Naphthalene	1	U		UG/L	JGJ-007-06
4GW06501C1	CFA-1931	Nickel	49.1			UG/L	DNT-015-06
4GW06501N2	CFA-1931	Nitrogen, Nitrate/Nitrite	1.94			MG/L	DNT-017-06
4GW06501C1	CFA-1931	Selenium	2.5	U		UG/L	DNT-015-06
4GW06501C1	CFA-1931	Silver	0.2	U		UG/L	DNT-015-06
4GW06501VA	CFA-1931	Styrene	1	U		UG/L	JGJ-007-06
4GW06501F3	CFA-1931	Sulfate	31.6			MG/L	DNT-017-06

Table A-2. (continued).

Field Sample		Compound	Sample Result	Result Qualifier	Validation Flag	Sample Units	L&V Report Number
Number	Location						
4GW06501VA	CFA-1931	Tert-butyl methyl ether	1	U		UG/L	JGJ-007-06
4GW06501VA	CFA-1931	Tetrachloroethylene	1	U		UG/L	JGJ-007-06
4GW06501C1	CFA-1931	Thallium	0.69	B	U	UG/L	DNT-015-06
4GW06501C1	CFA-1931	Tin	1	U		UG/L	DNT-015-06
4GW06501VA	CFA-1931	Toluene	2.3			UG/L	JGJ-007-06
4GW06501VA	CFA-1931	trans-1,2-Dichloroethylene	1	U		UG/L	JGJ-007-06
4GW06501VA	CFA-1931	trans-1,3-Dichloropropylene	1	U		UG/L	JGJ-007-06
4GW06501VA	CFA-1931	Trichloroethylene	1	U		UG/L	JGJ-007-06
4GW06501VA	CFA-1931	Trichlorofluoromethane	1	U		UG/L	JGJ-007-06
4GW06501VA	CFA-1931	Trichlorotrifluoroethane	5	U		UG/L	JGJ-007-06
4GW06501C1	CFA-1931	Vanadium	12.1	B		UG/L	DNT-015-06
4GW06501VA	CFA-1931	Vinyl Chloride	1	U		UG/L	JGJ-007-06
4GW06501VA	CFA-1931	Xylene (Total)	1	U		UG/L	JGJ-007-06
4GW06501C1	CFA-1931	Zinc	6.8	B	U	UG/L	DNT-015-06
4GW06601VA	CFA-1932	1,1,1-Trichloroethane	1	U		UG/L	JGJ-007-06
4GW06602VA	CFA-1932	1,1,1-Trichloroethane	1	U		UG/L	JGJ-007-06
4GW06601VA	CFA-1932	1,1,2,2-Tetrachloroethane	1	U		UG/L	JGJ-007-06
4GW06602VA	CFA-1932	1,1,2,2-Tetrachloroethane	1	U		UG/L	JGJ-007-06
4GW06601VA	CFA-1932	1,1,2-Trichloroethane	1	U		UG/L	JGJ-007-06
4GW06602VA	CFA-1932	1,1,2-Trichloroethane	1	U		UG/L	JGJ-007-06
4GW06601VA	CFA-1932	1,1-Dichloroethane	1	U		UG/L	JGJ-007-06
4GW06602VA	CFA-1932	1,1-Dichloroethane	1	U		UG/L	JGJ-007-06
4GW06601VA	CFA-1932	1,1-Dichloroethylene	1	U		UG/L	JGJ-007-06
4GW06602VA	CFA-1932	1,1-Dichloroethylene	1	U		UG/L	JGJ-007-06
4GW06601VA	CFA-1932	1,2,4-Trichlorobenzene	1	U		UG/L	JGJ-007-06
4GW06602VA	CFA-1932	1,2,4-Trichlorobenzene	1	U		UG/L	JGJ-007-06
4GW06601VA	CFA-1932	1,2,4-Trimethylbenzene	1	U		UG/L	JGJ-007-06
4GW06602VA	CFA-1932	1,2,4-Trimethylbenzene	1	U		UG/L	JGJ-007-06
4GW06601VA	CFA-1932	1,2-Dibromo-3-chloropropane	1	U		UG/L	JGJ-007-06
4GW06602VA	CFA-1932	1,2-Dibromo-3-chloropropane	1	U		UG/L	JGJ-007-06
4GW06601VA	CFA-1932	1,2-Dibromoethane	1	U		UG/L	JGJ-007-06
4GW06602VA	CFA-1932	1,2-Dibromoethane	1	U		UG/L	JGJ-007-06
4GW06601VA	CFA-1932	1,2-Dichlorobenzene	1	U		UG/L	JGJ-007-06
4GW06602VA	CFA-1932	1,2-Dichlorobenzene	1	U		UG/L	JGJ-007-06
4GW06601VA	CFA-1932	1,2-Dichloroethane	1	U		UG/L	JGJ-007-06
4GW06602VA	CFA-1932	1,2-Dichloroethane	1	U		UG/L	JGJ-007-06
4GW06601VA	CFA-1932	1,2-Dichloropropane	1	U		UG/L	JGJ-007-06
4GW06602VA	CFA-1932	1,2-Dichloropropane	1	U		UG/L	JGJ-007-06
4GW06601VA	CFA-1932	1,3,5-Trimethylbenzene	1	U		UG/L	JGJ-007-06
4GW06602VA	CFA-1932	1,3,5-Trimethylbenzene	1	U		UG/L	JGJ-007-06
4GW06601VA	CFA-1932	1,3-Dichlorobenzene	1	U		UG/L	JGJ-007-06
4GW06602VA	CFA-1932	1,3-Dichlorobenzene	1	U		UG/L	JGJ-007-06
4GW06601VA	CFA-1932	1,4-Dichlorobenzene	1	U		UG/L	JGJ-007-06
4GW06602VA	CFA-1932	1,4-Dichlorobenzene	1	U		UG/L	JGJ-007-06
4GW06601VA	CFA-1932	2-Butanone	5	U		UG/L	JGJ-007-06
4GW06602VA	CFA-1932	2-Butanone	5	U		UG/L	JGJ-007-06
4GW06601VA	CFA-1932	2-Chloroethyl vinyl ether	5	U		UG/L	JGJ-007-06
4GW06602VA	CFA-1932	2-Chloroethyl vinyl ether	5	U		UG/L	JGJ-007-06
4GW06601VA	CFA-1932	2-Hexanone	5	U		UG/L	JGJ-007-06
4GW06602VA	CFA-1932	2-Hexanone	5	U		UG/L	JGJ-007-06
4GW06601VA	CFA-1932	4-Methyl-2-pentanone	5	U		UG/L	JGJ-007-06
4GW06602VA	CFA-1932	4-Methyl-2-pentanone	5	U		UG/L	JGJ-007-06
4GW06601VA	CFA-1932	Acetone	5	U		UG/L	JGJ-007-06
4GW06602VA	CFA-1932	Acetone	5	U		UG/L	JGJ-007-06
4GW06601VA	CFA-1932	Acetonitrile	25	U	R	UG/L	JGJ-007-06
4GW06602VA	CFA-1932	Acetonitrile	25	U	R	UG/L	JGJ-007-06
4GW06601A1	CFA-1932	Alkalinity, Total as CaCO ₃	122			MG/L	DNT-017-06
4GW06602A1	CFA-1932	Alkalinity, Total as CaCO ₃	123			MG/L	DNT-017-06
4GW06601C1	CFA-1932	Antimony	0.5	U		UG/L	DNT-015-06
4GW06602C1	CFA-1932	Antimony	0.5	U		UG/L	DNT-015-06
4GW06601C1	CFA-1932	Arsenic	3.4	B		UG/L	DNT-015-06
4GW06602C1	CFA-1932	Arsenic	3	B		UG/L	DNT-015-06

Table A-2. (continued).

Field Sample		Compound	Sample Result	Result Qualifier	Validation Flag	Sample Units	L&V Report Number
Number	Location						
4GW06601C1	CFA-1932	Barium	107	B		UG/L	DNT-015-06
4GW06602C1	CFA-1932	Barium	108	B		UG/L	DNT-015-06
4GW06601VA	CFA-1932	Benzene	1	U		UG/L	JGJ-007-06
4GW06602VA	CFA-1932	Benzene	1	U		UG/L	JGJ-007-06
4GW06601C1	CFA-1932	Beryllium	0.1	U		UG/L	DNT-015-06
4GW06602C1	CFA-1932	Beryllium	0.1	U		UG/L	DNT-015-06
4GW06601VA	CFA-1932	Bromodichloromethane	1	U		UG/L	JGJ-007-06
4GW06602VA	CFA-1932	Bromodichloromethane	1	U		UG/L	JGJ-007-06
4GW06601VA	CFA-1932	Bromoform	1	U		UG/L	JGJ-007-06
4GW06602VA	CFA-1932	Bromoform	1	U		UG/L	JGJ-007-06
4GW06601VA	CFA-1932	Bromomethane	1	U		UG/L	JGJ-007-06
4GW06602VA	CFA-1932	Bromomethane	1	U		UG/L	JGJ-007-06
4GW06601C1	CFA-1932	Cadmium	0.1	U		UG/L	DNT-015-06
4GW06602C1	CFA-1932	Cadmium	0.1	U		UG/L	DNT-015-06
4GW06601VA	CFA-1932	Carbon disulfide	5	U		UG/L	JGJ-007-06
4GW06602VA	CFA-1932	Carbon disulfide	5	U		UG/L	JGJ-007-06
4GW06601VA	CFA-1932	Carbon tetrachloride	1	U		UG/L	JGJ-007-06
4GW06602VA	CFA-1932	Carbon tetrachloride	1	U		UG/L	JGJ-007-06
4GW06601F3	CFA-1932	Chloride	94.5			MG/L	DNT-017-06
4GW06602F3	CFA-1932	Chloride	95.1			MG/L	DNT-017-06
4GW06601VA	CFA-1932	Chlorobenzene	1	U		UG/L	JGJ-007-06
4GW06602VA	CFA-1932	Chlorobenzene	1	U		UG/L	JGJ-007-06
4GW06601VA	CFA-1932	Chloroethane	1	U		UG/L	JGJ-007-06
4GW06602VA	CFA-1932	Chloroethane	1	U		UG/L	JGJ-007-06
4GW06601VA	CFA-1932	Chloroform	1	U		UG/L	JGJ-007-06
4GW06602VA	CFA-1932	Chloroform	1	U		UG/L	JGJ-007-06
4GW06601VA	CFA-1932	Chloromethane	1	U		UG/L	JGJ-007-06
4GW06602VA	CFA-1932	Chloromethane	1	U		UG/L	JGJ-007-06
4GW06601C1	CFA-1932	Chromium	27.1	*N	R	UG/L	DNT-015-06
4GW06602C1	CFA-1932	Chromium	30.6	*N	R	UG/L	DNT-015-06
4GW06601VA	CFA-1932	cis-1,2-Dichloroethylene	1	U		UG/L	JGJ-007-06
4GW06602VA	CFA-1932	cis-1,2-Dichloroethylene	1	U		UG/L	JGJ-007-06
4GW06601VA	CFA-1932	cis-1,3-Dichloropropylene	1	U		UG/L	JGJ-007-06
4GW06602VA	CFA-1932	cis-1,3-Dichloropropylene	1	U		UG/L	JGJ-007-06
4GW06601C1	CFA-1932	Cobalt	1.1	B		UG/L	DNT-015-06
4GW06602C1	CFA-1932	Cobalt	1.1	B		UG/L	DNT-015-06
4GW06601C1	CFA-1932	Copper	10.6	*	J	UG/L	DNT-015-06
4GW06602C1	CFA-1932	Copper	9.2	*	J	UG/L	DNT-015-06
4GW06601VA	CFA-1932	Cyclohexane	1	U		UG/L	JGJ-007-06
4GW06602VA	CFA-1932	Cyclohexane	1	U		UG/L	JGJ-007-06
4GW06601VA	CFA-1932	Dibromochloromethane	1	U		UG/L	JGJ-007-06
4GW06602VA	CFA-1932	Dibromochloromethane	1	U		UG/L	JGJ-007-06
4GW06601VA	CFA-1932	Dichlorodifluoromethane	1	U		UG/L	JGJ-007-06
4GW06602VA	CFA-1932	Dichlorodifluoromethane	1	U		UG/L	JGJ-007-06
4GW06601VA	CFA-1932	Ethylbenzene	1	U		UG/L	JGJ-007-06
4GW06602VA	CFA-1932	Ethylbenzene	1	U		UG/L	JGJ-007-06
4GW06601F3	CFA-1932	Fluoride	0.209	J		MG/L	DNT-017-06
4GW06602F3	CFA-1932	Fluoride	0.204	J		MG/L	DNT-017-06
4GW06601VA	CFA-1932	Isopropylbenzene	1	U		UG/L	JGJ-007-06
4GW06602VA	CFA-1932	Isopropylbenzene	1	U		UG/L	JGJ-007-06
4GW06601C1	CFA-1932	Lead	1.1			UG/L	DNT-015-06
4GW06602C1	CFA-1932	Lead	0.93	B		UG/L	DNT-015-06
4GW06601C1	CFA-1932	Mercury	0.05	U		UG/L	DNT-015-06
4GW06602C1	CFA-1932	Mercury	0.05	U		UG/L	DNT-015-06
4GW06601VL	CFA-1932	Methane	14	U		UG/L	DMG-213-05
4GW06602VL	CFA-1932	Methane	14	U		UG/L	DMG-213-05
4GW06601VA	CFA-1932	Methyl acetate	5	U		UG/L	JGJ-007-06
4GW06602VA	CFA-1932	Methyl acetate	5	U		UG/L	JGJ-007-06
4GW06601VA	CFA-1932	Methyl cyclohexane	1	U		UG/L	JGJ-007-06
4GW06602VA	CFA-1932	Methyl cyclohexane	1	U		UG/L	JGJ-007-06
4GW06601VA	CFA-1932	Methylene Chloride	5	U		UG/L	JGJ-007-06
4GW06602VA	CFA-1932	Methylene Chloride	5	U		UG/L	JGJ-007-06

Table A-2. (continued).

Field Sample		Compound	Sample Result	Result Qualifier	Validation Flag	Sample Units	L&V Report Number
Number	Location						
4GW06601VA	CFA-1932	Naphthalene	1	U		UG/L	JGJ-007-06
4GW06602VA	CFA-1932	Naphthalene	1	U		UG/L	JGJ-007-06
4GW06601C1	CFA-1932	Nickel	54.2			UG/L	DNT-015-06
4GW06602C1	CFA-1932	Nickel	61.2			UG/L	DNT-015-06
4GW06601N2	CFA-1932	Nitrogen, Nitrate/Nitrite	2.22			MG/L	DNT-017-06
4GW06602N2	CFA-1932	Nitrogen, Nitrate/Nitrite	2.08			MG/L	DNT-017-06
4GW06601C1	CFA-1932	Selenium	2.5	U		UG/L	DNT-015-06
4GW06602C1	CFA-1932	Selenium	2.5	U		UG/L	DNT-015-06
4GW06601C1	CFA-1932	Silver	0.2	U		UG/L	DNT-015-06
4GW06602C1	CFA-1932	Silver	0.2	U		UG/L	DNT-015-06
4GW06601VA	CFA-1932	Styrene	1	U		UG/L	JGJ-007-06
4GW06602VA	CFA-1932	Styrene	1	U		UG/L	JGJ-007-06
4GW06601F3	CFA-1932	Sulfate	29.4			MG/L	DNT-017-06
4GW06602F3	CFA-1932	Sulfate	29.5			MG/L	DNT-017-06
4GW06601VA	CFA-1932	Tert-butyl methyl ether	1	U		UG/L	JGJ-007-06
4GW06602VA	CFA-1932	Tert-butyl methyl ether	1	U		UG/L	JGJ-007-06
4GW06601VA	CFA-1932	Tetrachloroethylene	1	U		UG/L	JGJ-007-06
4GW06602VA	CFA-1932	Tetrachloroethylene	1	U		UG/L	JGJ-007-06
4GW06601C1	CFA-1932	Thallium	0.4	U		UG/L	DNT-015-06
4GW06602C1	CFA-1932	Thallium	0.4	U		UG/L	DNT-015-06
4GW06601C1	CFA-1932	Tin	1	U		UG/L	DNT-015-06
4GW06602C1	CFA-1932	Tin	1	U		UG/L	DNT-015-06
4GW06601VA	CFA-1932	Toluene	1	U		UG/L	JGJ-007-06
4GW06602VA	CFA-1932	Toluene	1	U		UG/L	JGJ-007-06
4GW06601VA	CFA-1932	trans-1,2-Dichloroethylene	1	U		UG/L	JGJ-007-06
4GW06602VA	CFA-1932	trans-1,2-Dichloroethylene	1	U		UG/L	JGJ-007-06
4GW06601VA	CFA-1932	trans-1,3-Dichloropropylene	1	U		UG/L	JGJ-007-06
4GW06602VA	CFA-1932	trans-1,3-Dichloropropylene	1	U		UG/L	JGJ-007-06
4GW06601VA	CFA-1932	Trichloroethylene	1	U		UG/L	JGJ-007-06
4GW06602VA	CFA-1932	Trichloroethylene	1	U		UG/L	JGJ-007-06
4GW06601VA	CFA-1932	Trichlorofluoromethane	1	U		UG/L	JGJ-007-06
4GW06602VA	CFA-1932	Trichlorofluoromethane	1	U		UG/L	JGJ-007-06
4GW06601VA	CFA-1932	Trichlorotrifluoroethane	5	U		UG/L	JGJ-007-06
4GW06602VA	CFA-1932	Trichlorotrifluoroethane	5	U		UG/L	JGJ-007-06
4GW06601C1	CFA-1932	Vanadium	8.5	B		UG/L	DNT-015-06
4GW06602C1	CFA-1932	Vanadium	10.1	B		UG/L	DNT-015-06
4GW06601VA	CFA-1932	Vinyl Chloride	1	U		UG/L	JGJ-007-06
4GW06602VA	CFA-1932	Vinyl Chloride	1	U		UG/L	JGJ-007-06
4GW06601VA	CFA-1932	Xylene (Total)	1	U		UG/L	JGJ-007-06
4GW06602VA	CFA-1932	Xylene (Total)	1	U		UG/L	JGJ-007-06
4GW06601C1	CFA-1932	Zinc	13.4	B		UG/L	DNT-015-06
4GW06602C1	CFA-1932	Zinc	13.5	B		UG/L	DNT-015-06
4GW03601VA	CFA-MON-001	1,1,1-Trichloroethane	1	U		UG/L	DMG-203-05
4GW03601VA	CFA-MON-001	1,1,2,2-Tetrachloroethane	1	U		UG/L	DMG-203-05
4GW03601VA	CFA-MON-001	1,1,2-Trichloroethane	1	U		UG/L	DMG-203-05
4GW03601VA	CFA-MON-001	1,1-Dichloroethane	1	U		UG/L	DMG-203-05
4GW03601VA	CFA-MON-001	1,1-Dichloroethylene	1	U		UG/L	DMG-203-05
4GW03601VA	CFA-MON-001	1,2,4-Trichlorobenzene	1	U		UG/L	DMG-203-05
4GW03601VA	CFA-MON-001	1,2,4-Trimethylbenzene	1	U		UG/L	DMG-203-05
4GW03601VA	CFA-MON-001	1,2-Dibromo-3-chloropropane	1	U		UG/L	DMG-203-05
4GW03601VA	CFA-MON-001	1,2-Dibromoethane	1	U		UG/L	DMG-203-05
4GW03601VA	CFA-MON-001	1,2-Dichlorobenzene	1	U		UG/L	DMG-203-05
4GW03601VA	CFA-MON-001	1,2-Dichloroethane	1	U		UG/L	DMG-203-05
4GW03601VA	CFA-MON-001	1,2-Dichloropropane	1	U		UG/L	DMG-203-05
4GW03601VA	CFA-MON-001	1,3,5-Trimethylbenzene	1	U		UG/L	DMG-203-05
4GW03601VA	CFA-MON-001	1,3-Dichlorobenzene	1	U		UG/L	DMG-203-05
4GW03601VA	CFA-MON-001	1,4-Dichlorobenzene	1	U		UG/L	DMG-203-05
4GW03601VA	CFA-MON-001	2-Butanone	5	U		UG/L	DMG-203-05
4GW03601VA	CFA-MON-001	2-Chloroethyl vinyl ether	5	U		UG/L	DMG-203-05
4GW03601VA	CFA-MON-001	2-Hexanone	5	U		UG/L	DMG-203-05
4GW03601VA	CFA-MON-001	4-Methyl-2-pentanone	5	U		UG/L	DMG-203-05
4GW03601VA	CFA-MON-001	Acetone	5	U		UG/L	DMG-203-05

Table A-2. (continued).

Field Sample		Compound	Sample Result	Result Qualifier	Validation Flag	Sample Units	L&V Report Number
Number	Location						
4GW03601VA	CFA-MON-001	Acetonitrile	25	U	R	UG/L	DMG-203-05
4GW03601A1	CFA-MON-001	Alkalinity, Total as CaCO ₃	94.2			MG/L	DNT-464-05
4GW03601C1	CFA-MON-001	Antimony	0.5	U		UG/L	DNT-014-06
4GW03601C1	CFA-MON-001	Arsenic	2	B		UG/L	DNT-014-06
4GW03601C1	CFA-MON-001	Barium	25	B		UG/L	DNT-014-06
4GW03601VA	CFA-MON-001	Benzene	1	U		UG/L	DMG-203-05
4GW03601C1	CFA-MON-001	Beryllium	0.1	U		UG/L	DNT-014-06
4GW03601VA	CFA-MON-001	Bromodichloromethane	1	U		UG/L	DMG-203-05
4GW03601VA	CFA-MON-001	Bromoform	1	U		UG/L	DMG-203-05
4GW03601VA	CFA-MON-001	Bromomethane	1	U		UG/L	DMG-203-05
4GW03601C1	CFA-MON-001	Cadmium	0.1	U		UG/L	DNT-014-06
4GW03601VA	CFA-MON-001	Carbon disulfide	5	U		UG/L	DMG-203-05
4GW03601VA	CFA-MON-001	Carbon tetrachloride	1	U		UG/L	DMG-203-05
4GW03601F3	CFA-MON-001	Chloride	22.9		J	MG/L	DNT-016-06
4GW03601VA	CFA-MON-001	Chlorobenzene	1	U		UG/L	DMG-203-05
4GW03601VA	CFA-MON-001	Chloroethane	1	U		UG/L	DMG-203-05
4GW03601VA	CFA-MON-001	Chloroform	1	U		UG/L	DMG-203-05
4GW03601VA	CFA-MON-001	Chloromethane	1	U		UG/L	DMG-203-05
4GW03601C1	CFA-MON-001	Chromium	12.1			UG/L	DNT-014-06
4GW03601VA	CFA-MON-001	cis-1,2-Dichloroethylene	1	U		UG/L	DMG-203-05
4GW03601VA	CFA-MON-001	cis-1,3-Dichloropropylene	1	U		UG/L	DMG-203-05
4GW03601C1	CFA-MON-001	Cobalt	0.51	B		UG/L	DNT-014-06
4GW03601C1	CFA-MON-001	Copper	1.2			UG/L	DNT-014-06
4GW03601VA	CFA-MON-001	Cyclohexane	1	U		UG/L	DMG-203-05
4GW03601VA	CFA-MON-001	Dibromochloromethane	1	U		UG/L	DMG-203-05
4GW03601VA	CFA-MON-001	Dichlorodifluoromethane	1	U		UG/L	DMG-203-05
4GW03601VA	CFA-MON-001	Ethylbenzene	1	U		UG/L	DMG-203-05
4GW03601F3	CFA-MON-001	Fluoride	0.246	J		MG/L	DNT-016-06
4GW03601VA	CFA-MON-001	Isopropylbenzene	1	U		UG/L	DMG-203-05
4GW03601C1	CFA-MON-001	Lead	0.5	U		UG/L	DNT-014-06
4GW03601C1	CFA-MON-001	Mercury	0.11	B	U	UG/L	DNT-014-06
4GW03601VL	CFA-MON-001	Methane	25.3			UG/L	DMG-199-05
4GW03601VA	CFA-MON-001	Methyl acetate	5	U		UG/L	DMG-203-05
4GW03601VA	CFA-MON-001	Methyl cyclohexane	1	U		UG/L	DMG-203-05
4GW03601VA	CFA-MON-001	Methylene Chloride	5	U		UG/L	DMG-203-05
4GW03601VA	CFA-MON-001	Naphthalene	1	U		UG/L	DMG-203-05
4GW03601C1	CFA-MON-001	Nickel	9.9	B		UG/L	DNT-014-06
4GW03601N2	CFA-MON-001	Nitrogen, Nitrate/Nitrite	1.68			MG/L	DNT-016-06
4GW03601C1	CFA-MON-001	Selenium	2.5	U		UG/L	DNT-014-06
4GW03601C1	CFA-MON-001	Silver	0.2	U		UG/L	DNT-014-06
4GW03601VA	CFA-MON-001	Styrene	1	U		UG/L	DMG-203-05
4GW03601F3	CFA-MON-001	Sulfate	19.9			MG/L	DNT-016-06
4GW03601VA	CFA-MON-001	Tert-butyl methyl ether	1	U		UG/L	DMG-203-05
4GW03601VA	CFA-MON-001	Tetrachloroethylene	1	U		UG/L	DMG-203-05
4GW03601C1	CFA-MON-001	Thallium	0.4	U		UG/L	DNT-014-06
4GW03601C1	CFA-MON-001	Tin	1	U		UG/L	DNT-014-06
4GW03601VA	CFA-MON-001	Toluene	1	U		UG/L	DMG-203-05
4GW03601VA	CFA-MON-001	trans-1,2-Dichloroethylene	1	U		UG/L	DMG-203-05
4GW03601VA	CFA-MON-001	trans-1,3-Dichloropropylene	1	U		UG/L	DMG-203-05
4GW03601VA	CFA-MON-001	Trichloroethylene	1	U		UG/L	DMG-203-05
4GW03601VA	CFA-MON-001	Trichlorofluoromethane	1	U		UG/L	DMG-203-05
4GW03601VA	CFA-MON-001	Trichlorotrifluoroethane	5	U		UG/L	DMG-203-05
4GW03601C1	CFA-MON-001	Vanadium	6.7	B	U	UG/L	DNT-014-06
4GW03601VA	CFA-MON-001	Vinyl Chloride	1	U		UG/L	DMG-203-05
4GW03601VA	CFA-MON-001	Xylene (Total)	1	U		UG/L	DMG-203-05
4GW03601C1	CFA-MON-001	Zinc	53.9			UG/L	DNT-014-06
4GW03701VA	CFA-MON-002	1,1,1-Trichloroethane	1	U		UG/L	DMG-203-05
4GW03701VA	CFA-MON-002	1,1,2,2-Tetrachloroethane	1	U		UG/L	DMG-203-05
4GW03701VA	CFA-MON-002	1,1,2-Trichloroethane	1	U		UG/L	DMG-203-05
4GW03701VA	CFA-MON-002	1,1-Dichloroethane	1	U		UG/L	DMG-203-05
4GW03701VA	CFA-MON-002	1,1-Dichloroethylene	1	U		UG/L	DMG-203-05
4GW03701VA	CFA-MON-002	1,2,4-Trichlorobenzene	1	U		UG/L	DMG-203-05

Table A-2. (continued).

Field Sample		Compound	Sample Result	Result Qualifier	Validation Flag	Sample Units	L&V Report Number
Number	Location						
4GW03701VA	CFA-MON-002	1,2,4-Trimethylbenzene	1	U		UG/L	DMG-203-05
4GW03701VA	CFA-MON-002	1,2-Dibromo-3-chloropropane	1	U		UG/L	DMG-203-05
4GW03701VA	CFA-MON-002	1,2-Dibromoethane	1	U		UG/L	DMG-203-05
4GW03701VA	CFA-MON-002	1,2-Dichlorobenzene	1	U		UG/L	DMG-203-05
4GW03701VA	CFA-MON-002	1,2-Dichloroethane	1	U		UG/L	DMG-203-05
4GW03701VA	CFA-MON-002	1,2-Dichloropropane	1	U		UG/L	DMG-203-05
4GW03701VA	CFA-MON-002	1,3,5-Trimethylbenzene	1	U		UG/L	DMG-203-05
4GW03701VA	CFA-MON-002	1,3-Dichlorobenzene	1	U		UG/L	DMG-203-05
4GW03701VA	CFA-MON-002	1,4-Dichlorobenzene	1	U		UG/L	DMG-203-05
4GW03701VA	CFA-MON-002	2-Butanone	5	U		UG/L	DMG-203-05
4GW03701VA	CFA-MON-002	2-Chloroethyl vinyl ether	5	U		UG/L	DMG-203-05
4GW03701VA	CFA-MON-002	2-Hexanone	5	U		UG/L	DMG-203-05
4GW03701VA	CFA-MON-002	4-Methyl-2-pentanone	5	U		UG/L	DMG-203-05
4GW03701VA	CFA-MON-002	Acetone	5	U		UG/L	DMG-203-05
4GW03701VA	CFA-MON-002	Acetonitrile	25	U	R	UG/L	DMG-203-05
4GW03701A1	CFA-MON-002	Alkalinity, Total as CaCO ₃	95.2			MG/L	DNT-464-05
4GW03701C1	CFA-MON-002	Antimony	0.5	U		UG/L	DNT-014-06
4GW03701C1	CFA-MON-002	Arsenic	1.5	U		UG/L	DNT-014-06
4GW03701C1	CFA-MON-002	Barium	48	B		UG/L	DNT-014-06
4GW03701VA	CFA-MON-002	Benzene	1	U		UG/L	DMG-203-05
4GW03701C1	CFA-MON-002	Beryllium	0.1	U		UG/L	DNT-014-06
4GW03701VA	CFA-MON-002	Bromodichloromethane	1	U		UG/L	DMG-203-05
4GW03701VA	CFA-MON-002	Bromoform	1	U		UG/L	DMG-203-05
4GW03701VA	CFA-MON-002	Bromomethane	1	U		UG/L	DMG-203-05
4GW03701C1	CFA-MON-002	Cadmium	0.1	U		UG/L	DNT-014-06
4GW03701VA	CFA-MON-002	Carbon disulfide	5	U		UG/L	DMG-203-05
4GW03701VA	CFA-MON-002	Carbon tetrachloride	1	U		UG/L	DMG-203-05
4GW03701F3	CFA-MON-002	Chloride	55		J	MG/L	DNT-016-06
4GW03701VA	CFA-MON-002	Chlorobenzene	1	U		UG/L	DMG-203-05
4GW03701VA	CFA-MON-002	Chloroethane	1	U		UG/L	DMG-203-05
4GW03701VA	CFA-MON-002	Chloroform	1	U		UG/L	DMG-203-05
4GW03701VA	CFA-MON-002	Chloromethane	1	U		UG/L	DMG-203-05
4GW03701C1	CFA-MON-002	Chromium	26.1			UG/L	DNT-014-06
4GW03701VA	CFA-MON-002	cis-1,2-Dichloroethylene	1	U		UG/L	DMG-203-05
4GW03701VA	CFA-MON-002	cis-1,3-Dichloropropylene	1	U		UG/L	DMG-203-05
4GW03701C1	CFA-MON-002	Cobalt	0.99	B		UG/L	DNT-014-06
4GW03701C1	CFA-MON-002	Copper	6.3			UG/L	DNT-014-06
4GW03701VA	CFA-MON-002	Cyclohexane	1	U		UG/L	DMG-203-05
4GW03701VA	CFA-MON-002	Dibromochloromethane	1	U		UG/L	DMG-203-05
4GW03701VA	CFA-MON-002	Dichlorodifluoromethane	1	U		UG/L	DMG-203-05
4GW03701VA	CFA-MON-002	Ethylbenzene	1	U		UG/L	DMG-203-05
4GW03701F3	CFA-MON-002	Fluoride	0.189	J		MG/L	DNT-016-06
4GW03701VA	CFA-MON-002	Isopropylbenzene	1	U		UG/L	DMG-203-05
4GW03701C1	CFA-MON-002	Lead	1.6			UG/L	DNT-014-06
4GW03701C1	CFA-MON-002	Mercury	0.12	B	U	UG/L	DNT-014-06
4GW03701VL	CFA-MON-002	Methane	190			UG/L	DMG-199-05
4GW03701VA	CFA-MON-002	Methyl acetate	5	U		UG/L	DMG-203-05
4GW03701VA	CFA-MON-002	Methyl cyclohexane	1	U		UG/L	DMG-203-05
4GW03701VA	CFA-MON-002	Methylene Chloride	5	U		UG/L	DMG-203-05
4GW03701VA	CFA-MON-002	Naphthalene	1	U		UG/L	DMG-203-05
4GW03701C1	CFA-MON-002	Nickel	21.2	B		UG/L	DNT-014-06
4GW03701N2	CFA-MON-002	Nitrogen, Nitrate/Nitrite	17.9			MG/L	DNT-016-06
4GW03701C1	CFA-MON-002	Selenium	2.5	U		UG/L	DNT-014-06
4GW03701C1	CFA-MON-002	Silver	0.2	U		UG/L	DNT-014-06
4GW03701VA	CFA-MON-002	Styrene	1	U		UG/L	DMG-203-05
4GW03701F3	CFA-MON-002	Sulfate	29.1			MG/L	DNT-016-06
4GW03701VA	CFA-MON-002	Tert-butyl methyl ether	1	U		UG/L	DMG-203-05
4GW03701VA	CFA-MON-002	Tetrachloroethylene	1	U		UG/L	DMG-203-05
4GW03701C1	CFA-MON-002	Thallium	0.4	U		UG/L	DNT-014-06
4GW03701C1	CFA-MON-002	Tin	1	U		UG/L	DNT-014-06
4GW03701VA	CFA-MON-002	Toluene	1	U		UG/L	DMG-203-05
4GW03701VA	CFA-MON-002	trans-1,2-Dichloroethylene	1	U		UG/L	DMG-203-05

Table A-2. (continued).

Field Sample		Compound	Sample Result	Result Qualifier	Validation Flag	Sample Units	L&V Report Number
Number	Location						
4GW03701VA	CFA-MON-002	trans-1,3-Dichloropropylene	1	U		UG/L	DMG-203-05
4GW03701VA	CFA-MON-002	Trichloroethylene	1	U		UG/L	DMG-203-05
4GW03701VA	CFA-MON-002	Trichlorofluoromethane	1	U		UG/L	DMG-203-05
4GW03701VA	CFA-MON-002	Trichlorotrifluoroethane	5	U		UG/L	DMG-203-05
4GW03701C1	CFA-MON-002	Vanadium	6.1	B	U	UG/L	DNT-014-06
4GW03701VA	CFA-MON-002	Vinyl Chloride	1	U		UG/L	DMG-203-05
4GW03701VA	CFA-MON-002	Xylene (Total)	1	U		UG/L	DMG-203-05
4GW03701C1	CFA-MON-002	Zinc	110			UG/L	DNT-014-06
4GW03801VA	CFA-MON-003	1,1,1-Trichloroethane	1	U		UG/L	DMG-203-05
4GW03801VA	CFA-MON-003	1,1,2,2-Tetrachloroethane	1	U		UG/L	DMG-203-05
4GW03801VA	CFA-MON-003	1,1,2-Trichloroethane	1	U		UG/L	DMG-203-05
4GW03801VA	CFA-MON-003	1,1-Dichloroethane	1	U		UG/L	DMG-203-05
4GW03801VA	CFA-MON-003	1,1-Dichloroethylene	1	U		UG/L	DMG-203-05
4GW03801VA	CFA-MON-003	1,2,4-Trichlorobenzene	1	U		UG/L	DMG-203-05
4GW03801VA	CFA-MON-003	1,2,4-Trimethylbenzene	1	U		UG/L	DMG-203-05
4GW03801VA	CFA-MON-003	1,2-Dibromo-3-chloropropane	1	U		UG/L	DMG-203-05
4GW03801VA	CFA-MON-003	1,2-Dibromoethane	1	U		UG/L	DMG-203-05
4GW03801VA	CFA-MON-003	1,2-Dichlorobenzene	1	U		UG/L	DMG-203-05
4GW03801VA	CFA-MON-003	1,2-Dichloroethane	1	U		UG/L	DMG-203-05
4GW03801VA	CFA-MON-003	1,2-Dichloropropane	1	U		UG/L	DMG-203-05
4GW03801VA	CFA-MON-003	1,3,5-Trimethylbenzene	1	U		UG/L	DMG-203-05
4GW03801VA	CFA-MON-003	1,3-Dichlorobenzene	1	U		UG/L	DMG-203-05
4GW03801VA	CFA-MON-003	1,4-Dichlorobenzene	1	U		UG/L	DMG-203-05
4GW03801VA	CFA-MON-003	2-Butanone	5	U		UG/L	DMG-203-05
4GW03801VA	CFA-MON-003	2-Chloroethyl vinyl ether	5	U		UG/L	DMG-203-05
4GW03801VA	CFA-MON-003	2-Hexanone	5	U		UG/L	DMG-203-05
4GW03801VA	CFA-MON-003	4-Methyl-2-pentanone	5	U		UG/L	DMG-203-05
4GW03801VA	CFA-MON-003	Acetone	5	U		UG/L	DMG-203-05
4GW03801VA	CFA-MON-003	Acetonitrile	25	U	R	UG/L	DMG-203-05
4GW03801A1	CFA-MON-003	Alkalinity, Total as CaCO ₃	93.2			MG/L	DNT-464-05
4GW03801C1	CFA-MON-003	Antimony	0.5	U		UG/L	DNT-014-06
4GW03801C1	CFA-MON-003	Arsenic	1.9	B		UG/L	DNT-014-06
4GW03801C1	CFA-MON-003	Barium	40	B		UG/L	DNT-014-06
4GW03801VA	CFA-MON-003	Benzene	1	U		UG/L	DMG-203-05
4GW03801C1	CFA-MON-003	Beryllium	0.1	U		UG/L	DNT-014-06
4GW03801VA	CFA-MON-003	Bromodichloromethane	1	U		UG/L	DMG-203-05
4GW03801VA	CFA-MON-003	Bromoform	1	U		UG/L	DMG-203-05
4GW03801VA	CFA-MON-003	Bromomethane	1	U		UG/L	DMG-203-05
4GW03801C1	CFA-MON-003	Cadmium	0.1	U		UG/L	DNT-014-06
4GW03801VA	CFA-MON-003	Carbon disulfide	5	U		UG/L	DMG-203-05
4GW03801VA	CFA-MON-003	Carbon tetrachloride	1	U		UG/L	DMG-203-05
4GW03801F3	CFA-MON-003	Chloride	42.9		J	MG/L	DNT-016-06
4GW03801VA	CFA-MON-003	Chlorobenzene	1	U		UG/L	DMG-203-05
4GW03801VA	CFA-MON-003	Chloroethane	1	U		UG/L	DMG-203-05
4GW03801VA	CFA-MON-003	Chloroform	1	U		UG/L	DMG-203-05
4GW03801VA	CFA-MON-003	Chloromethane	1	U		UG/L	DMG-203-05
4GW03801C1	CFA-MON-003	Chromium	11.5			UG/L	DNT-014-06
4GW03801VA	CFA-MON-003	cis-1,2-Dichloroethylene	1	U		UG/L	DMG-203-05
4GW03801VA	CFA-MON-003	cis-1,3-Dichloropropylene	1	U		UG/L	DMG-203-05
4GW03801C1	CFA-MON-003	Cobalt	0.29	B		UG/L	DNT-014-06
4GW03801C1	CFA-MON-003	Copper	1.8			UG/L	DNT-014-06
4GW03801VA	CFA-MON-003	Cyclohexane	1	U		UG/L	DMG-203-05
4GW03801VA	CFA-MON-003	Dibromochloromethane	1	U		UG/L	DMG-203-05
4GW03801VA	CFA-MON-003	Dichlorodifluoromethane	1	U		UG/L	DMG-203-05
4GW03801VA	CFA-MON-003	Ethylbenzene	1	U		UG/L	DMG-203-05
4GW03801F3	CFA-MON-003	Fluoride	0.22	J		MG/L	DNT-016-06
4GW03801VA	CFA-MON-003	Isopropylbenzene	1	U		UG/L	DMG-203-05
4GW03801C1	CFA-MON-003	Lead	1			UG/L	DNT-014-06
4GW03801C1	CFA-MON-003	Mercury	0.066	B	U	UG/L	DNT-014-06
4GW03801VL	CFA-MON-003	Methane	14	U		UG/L	DMG-199-05
4GW03801VA	CFA-MON-003	Methyl acetate	5	U		UG/L	DMG-203-05
4GW03801VA	CFA-MON-003	Methyl cyclohexane	1	U		UG/L	DMG-203-05

Table A-2. (continued).

Field Sample		Compound	Sample Result	Result Qualifier	Validation Flag	Sample Units	L&V Report Number
Number	Location						
4GW03801VA	CFA-MON-003	Methylene Chloride	5	U		UG/L	DMG-203-05
4GW03801VA	CFA-MON-003	Naphthalene	1	U		UG/L	DMG-203-05
4GW03801C1	CFA-MON-003	Nickel	2.5	B		UG/L	DNT-014-06
4GW03801N2	CFA-MON-003	Nitrogen, Nitrate/Nitrite	24			MG/L	DNT-016-06
4GW03801C1	CFA-MON-003	Selenium	2.5	U		UG/L	DNT-014-06
4GW03801C1	CFA-MON-003	Silver	0.2	U		UG/L	DNT-014-06
4GW03801VA	CFA-MON-003	Styrene	1	U		UG/L	DMG-203-05
4GW03801F3	CFA-MON-003	Sulfate	24.9			MG/L	DNT-016-06
4GW03801VA	CFA-MON-003	Tert-butyl methyl ether	1	U		UG/L	DMG-203-05
4GW03801VA	CFA-MON-003	Tetrachloroethylene	1	U		UG/L	DMG-203-05
4GW03801C1	CFA-MON-003	Thallium	0.4	U		UG/L	DNT-014-06
4GW03801C1	CFA-MON-003	Tin	1	U		UG/L	DNT-014-06
4GW03801VA	CFA-MON-003	Toluene	1	U		UG/L	DMG-203-05
4GW03801VA	CFA-MON-003	trans-1,2-Dichloroethylene	1	U		UG/L	DMG-203-05
4GW03801VA	CFA-MON-003	trans-1,3-Dichloropropylene	1	U		UG/L	DMG-203-05
4GW03801VA	CFA-MON-003	Trichloroethylene	1	U		UG/L	DMG-203-05
4GW03801VA	CFA-MON-003	Trichlorofluoromethane	1	U		UG/L	DMG-203-05
4GW03801VA	CFA-MON-003	Trichlorotrifluoroethane	5	U		UG/L	DMG-203-05
4GW03801C1	CFA-MON-003	Vanadium	5.8	B	U	UG/L	DNT-014-06
4GW03801VA	CFA-MON-003	Vinyl Chloride	1	U		UG/L	DMG-203-05
4GW03801VA	CFA-MON-003	Xylene (Total)	1	U		UG/L	DMG-203-05
4GW03801C1	CFA-MON-003	Zinc	30.1			UG/L	DNT-014-06
4GW03301VA	LF3-08	1,1,1-Trichloroethane	1	U		UG/L	DMG-203-05
4GW03301VA	LF3-08	1,1,2,2-Tetrachloroethane	1	U		UG/L	DMG-203-05
4GW03301VA	LF3-08	1,1,2-Trichloroethane	1	U		UG/L	DMG-203-05
4GW03301VA	LF3-08	1,1-Dichloroethane	1	U		UG/L	DMG-203-05
4GW03301VA	LF3-08	1,1-Dichloroethylene	1	U		UG/L	DMG-203-05
4GW03301VA	LF3-08	1,2,4-Trichlorobenzene	1	U		UG/L	DMG-203-05
4GW03301VA	LF3-08	1,2,4-Trimethylbenzene	1	U		UG/L	DMG-203-05
4GW03301VA	LF3-08	1,2-Dibromo-3-chloropropane	1	U		UG/L	DMG-203-05
4GW03301VA	LF3-08	1,2-Dibromoethane	1	U		UG/L	DMG-203-05
4GW03301VA	LF3-08	1,2-Dichlorobenzene	1	U		UG/L	DMG-203-05
4GW03301VA	LF3-08	1,2-Dichloroethane	1	U		UG/L	DMG-203-05
4GW03301VA	LF3-08	1,2-Dichloropropane	1	U		UG/L	DMG-203-05
4GW03301VA	LF3-08	1,3,5-Trimethylbenzene	1	U		UG/L	DMG-203-05
4GW03301VA	LF3-08	1,3-Dichlorobenzene	1	U		UG/L	DMG-203-05
4GW03301VA	LF3-08	1,4-Dichlorobenzene	1	U		UG/L	DMG-203-05
4GW03301VA	LF3-08	2-Butanone	5	U		UG/L	DMG-203-05
4GW03301VA	LF3-08	2-Chloroethyl vinyl ether	5	U		UG/L	DMG-203-05
4GW03301VA	LF3-08	2-Hexanone	5	U		UG/L	DMG-203-05
4GW03301VA	LF3-08	4-Methyl-2-pentanone	5	U		UG/L	DMG-203-05
4GW03301VA	LF3-08	Acetone	5	U		UG/L	DMG-203-05
4GW03301VA	LF3-08	Acetonitrile	25	U	R	UG/L	DMG-203-05
4GW03301A1	LF3-08	Alkalinity, Total as CaCO ₃	127			MG/L	DNT-464-05
4GW03301C1	LF3-08	Antimony	0.5	U		UG/L	DNT-014-06
4GW03301C1	LF3-08	Arsenic	1.5	U		UG/L	DNT-014-06
4GW03301C1	LF3-08	Barium	101	B		UG/L	DNT-014-06
4GW03301VA	LF3-08	Benzene	1	U		UG/L	DMG-203-05
4GW03301C1	LF3-08	Beryllium	0.1	U		UG/L	DNT-014-06
4GW03301VA	LF3-08	Bromodichloromethane	1	U		UG/L	DMG-203-05
4GW03301VA	LF3-08	Bromoform	1	U		UG/L	DMG-203-05
4GW03301VA	LF3-08	Bromomethane	1	U		UG/L	DMG-203-05
4GW03301C1	LF3-08	Cadmium	0.1	U		UG/L	DNT-014-06
4GW03301VA	LF3-08	Carbon disulfide	5	U		UG/L	DMG-203-05
4GW03301VA	LF3-08	Carbon tetrachloride	1	U		UG/L	DMG-203-05
4GW03301F3	LF3-08	Chloride	58.1		J	MG/L	DNT-016-06
4GW03301VA	LF3-08	Chlorobenzene	1	U		UG/L	DMG-203-05
4GW03301VA	LF3-08	Chloroethane	1	U		UG/L	DMG-203-05
4GW03301VA	LF3-08	Chloroform	1	U		UG/L	DMG-203-05
4GW03301VA	LF3-08	Chloromethane	1	U		UG/L	DMG-203-05
4GW03301C1	LF3-08	Chromium	22.6			UG/L	DNT-014-06
4GW03301VA	LF3-08	cis-1,2-Dichloroethylene	1	U		UG/L	DMG-203-05

Table A-2. (continued).

Field Sample			Compound	Sample Result	Result Qualifier	Validation Flag	Sample Units	L&V Report Number
	Number	Location						
4GW03301VA	LF3-08		cis-1,3-Dichloropropylene	1	U		UG/L	DMG-203-05
4GW03301C1	LF3-08		Cobalt	0.97	B		UG/L	DNT-014-06
4GW03301C1	LF3-08		Copper	1.8			UG/L	DNT-014-06
4GW03301VA	LF3-08		Cyclohexane	1	U		UG/L	DMG-203-05
4GW03301VA	LF3-08		Dibromochloromethane	1	U		UG/L	DMG-203-05
4GW03301VA	LF3-08		Dichlorodifluoromethane	1	U		UG/L	DMG-203-05
4GW03301VA	LF3-08		Ethylbenzene	1	U		UG/L	DMG-203-05
4GW03301F3	LF3-08		Fluoride	0.228	J		MG/L	DNT-016-06
4GW03301VA	LF3-08		Isopropylbenzene	1	U		UG/L	DMG-203-05
4GW03301C1	LF3-08		Lead	1.2			UG/L	DNT-014-06
4GW03301C1	LF3-08		Mercury	0.098	B	U	UG/L	DNT-014-06
4GW03301VL	LF3-08		Methane	14	U		UG/L	DMG-199-05
4GW03301VA	LF3-08		Methyl acetate	5	U		UG/L	DMG-203-05
4GW03301VA	LF3-08		Methyl cyclohexane	1	U		UG/L	DMG-203-05
4GW03301VA	LF3-08		Methylene Chloride	5	U		UG/L	DMG-203-05
4GW03301VA	LF3-08		Naphthalene	1	U		UG/L	DMG-203-05
4GW03301C1	LF3-08		Nickel	15.3	B		UG/L	DNT-014-06
4GW03301N2	LF3-08		Nitrogen, Nitrate/Nitrite	2.5			MG/L	DNT-016-06
4GW03301C1	LF3-08		Selenium	2.5	U		UG/L	DNT-014-06
4GW03301C1	LF3-08		Silver	0.2	U		UG/L	DNT-014-06
4GW03301VA	LF3-08		Styrene	1	U		UG/L	DMG-203-05
4GW03301F3	LF3-08		Sulfate	31.5			MG/L	DNT-016-06
4GW03301VA	LF3-08		Tert-butyl methyl ether	1	U		UG/L	DMG-203-05
4GW03301VA	LF3-08		Tetrachloroethylene	1	U		UG/L	DMG-203-05
4GW03301C1	LF3-08		Thallium	0.4	U		UG/L	DNT-014-06
4GW03301C1	LF3-08		Tin	1	U		UG/L	DNT-014-06
4GW03301VA	LF3-08		Toluene	1	U		UG/L	DMG-203-05
4GW03301VA	LF3-08		trans-1,2-Dichloroethylene	1	U		UG/L	DMG-203-05
4GW03301VA	LF3-08		trans-1,3-Dichloropropylene	1	U		UG/L	DMG-203-05
4GW03301VA	LF3-08		Trichloroethylene	1	U		UG/L	DMG-203-05
4GW03301VA	LF3-08		Trichlorofluoromethane	1	U		UG/L	DMG-203-05
4GW03301VA	LF3-08		Trichlorotrifluoroethane	5	U		UG/L	DMG-203-05
4GW03301C1	LF3-08		Vanadium	4.7	B	U	UG/L	DNT-014-06
4GW03301VA	LF3-08		Vinyl Chloride	1	U		UG/L	DMG-203-05
4GW03301VA	LF3-08		Xylene (Total)	1	U		UG/L	DMG-203-05
4GW03301C1	LF3-08		Zinc	61.9			UG/L	DNT-014-06
4GW03401VA	LF3-09		1,1,1-Trichloroethane	1	U		UG/L	DMG-203-05
4GW03401VA	LF3-09		1,1,2,2-Tetrachloroethane	1	U		UG/L	DMG-203-05
4GW03401VA	LF3-09		1,1,2-Trichloroethane	1	U		UG/L	DMG-203-05
4GW03401VA	LF3-09		1,1-Dichloroethane	1	U		UG/L	DMG-203-05
4GW03401VA	LF3-09		1,1-Dichloroethylene	1	U		UG/L	DMG-203-05
4GW03401VA	LF3-09		1,2,4-Trichlorobenzene	1	U		UG/L	DMG-203-05
4GW03401VA	LF3-09		1,2,4-Trimethylbenzene	1	U		UG/L	DMG-203-05
4GW03401VA	LF3-09		1,2-Dibromo-3-chloropropane	1	U		UG/L	DMG-203-05
4GW03401VA	LF3-09		1,2-Dibromoethane	1	U		UG/L	DMG-203-05
4GW03401VA	LF3-09		1,2-Dichlorobenzene	1	U		UG/L	DMG-203-05
4GW03401VA	LF3-09		1,2-Dichloroethane	1	U		UG/L	DMG-203-05
4GW03401VA	LF3-09		1,2-Dichloropropane	1	U		UG/L	DMG-203-05
4GW03401VA	LF3-09		1,3,5-Trimethylbenzene	1	U		UG/L	DMG-203-05
4GW03401VA	LF3-09		1,3-Dichlorobenzene	1	U		UG/L	DMG-203-05
4GW03401VA	LF3-09		1,4-Dichlorobenzene	1	U		UG/L	DMG-203-05
4GW03401VA	LF3-09		2-Butanone	5	U		UG/L	DMG-203-05
4GW03401VA	LF3-09		2-Chloroethyl vinyl ether	5	U		UG/L	DMG-203-05
4GW03401VA	LF3-09		2-Hexanone	5	U		UG/L	DMG-203-05
4GW03401VA	LF3-09		4-Methyl-2-pentanone	5	U		UG/L	DMG-203-05
4GW03401VA	LF3-09		Acetone	5	U		UG/L	DMG-203-05
4GW03401VA	LF3-09		Acetonitrile	25	U	R	UG/L	DMG-203-05
4GW03401A1	LF3-09		Alkalinity, Total as CaCO ₃	113			MG/L	DNT-464-05
4GW03401C1	LF3-09		Antimony	0.5	U		UG/L	DNT-014-06
4GW03401C1	LF3-09		Arsenic	1.5	U		UG/L	DNT-014-06
4GW03401C1	LF3-09		Barium	131	B		UG/L	DNT-014-06
4GW03401VA	LF3-09		Benzene	1	U		UG/L	DMG-203-05

Table A-2. (continued).

Field Sample		Compound	Sample Result	Result Qualifier	Validation Flag	Sample Units	L&V Report Number	
Number	Location							
4GW03401C1	LF3-09	Beryllium	0.1	U		UG/L	DNT-014-06	
4GW03401VA	LF3-09	Bromodichloromethane	1	U		UG/L	DMG-203-05	
4GW03401VA	LF3-09	Bromoform	1	U		UG/L	DMG-203-05	
4GW03401VA	LF3-09	Bromomethane	1	U		UG/L	DMG-203-05	
4GW03401C1	LF3-09	Cadmium	0.19	B		UG/L	DNT-014-06	
4GW03401VA	LF3-09	Carbon disulfide	5	U		UG/L	DMG-203-05	
4GW03401VA	LF3-09	Carbon tetrachloride	1	U		UG/L	DMG-203-05	
4GW03401F3	LF3-09	Chloride	146		J	MG/L	DNT-016-06	
4GW03401VA	LF3-09	Chlorobenzene	1	U		UG/L	DMG-203-05	
4GW03401VA	LF3-09	Chloroethane	1	U		UG/L	DMG-203-05	
4GW03401VA	LF3-09	Chloroform	1	U		UG/L	DMG-203-05	
4GW03401VA	LF3-09	Chloromethane	1	U		UG/L	DMG-203-05	
4GW03401C1	LF3-09	Chromium	176			UG/L	DNT-014-06	
4GW03401VA	LF3-09	cis-1,2-Dichloroethylene	1	U		UG/L	DMG-203-05	
4GW03401VA	LF3-09	cis-1,3-Dichloropropylene	1	U		UG/L	DMG-203-05	
4GW03401C1	LF3-09	Cobalt	18.2	B		UG/L	DNT-014-06	
4GW03401C1	LF3-09	Copper	14.2			UG/L	DNT-014-06	
4GW03401VA	LF3-09	Cyclohexane	1	U		UG/L	DMG-203-05	
4GW03401VA	LF3-09	Dibromochloromethane	1	U		UG/L	DMG-203-05	
4GW03401VA	LF3-09	Dichlorodifluoromethane	1	U		UG/L	DMG-203-05	
4GW03401VA	LF3-09	Ethylbenzene	1	U		UG/L	DMG-203-05	
4GW03401F3	LF3-09	Fluoride	0.192	J		MG/L	DNT-016-06	
4GW03401VA	LF3-09	Isopropylbenzene	1	U		UG/L	DMG-203-05	
4GW03401C1	LF3-09	Lead	4.2			UG/L	DNT-014-06	
4GW03401C1	LF3-09	Mercury	0.13	B		UG/L	DNT-014-06	
4GW03401VL	LF3-09	Methane	14	U		UG/L	DMG-199-05	
4GW03401VA	LF3-09	Methyl acetate	5	U		UG/L	DMG-203-05	
4GW03401VA	LF3-09	Methyl cyclohexane	1	U		UG/L	DMG-203-05	
4GW03401VA	LF3-09	Methylene Chloride	5	U		UG/L	DMG-203-05	
4GW03401VA	LF3-09	Naphthalene	1	U		UG/L	DMG-203-05	
4GW03401C1	LF3-09	Nickel	775			UG/L	DNT-014-06	
4GW03401N2	LF3-09	Nitrogen, Nitrate/Nitrite	3.02			MG/L	DNT-016-06	
4GW03401C1	LF3-09	Selenium	2.5	U		UG/L	DNT-014-06	
4GW03401C1	LF3-09	Silver	0.2	U		UG/L	DNT-014-06	
4GW03401VA	LF3-09	Styrene	1	U		UG/L	DMG-203-05	
4GW03401F3	LF3-09	Sulfate	32			MG/L	DNT-016-06	
4GW03401VA	LF3-09	Tert-butyl methyl ether	1	U		UG/L	DMG-203-05	
4GW03401VA	LF3-09	Tetrachloroethylene	1	U		UG/L	DMG-203-05	
4GW03401C1	LF3-09	Thallium	0.4	U		UG/L	DNT-014-06	
4GW03401C1	LF3-09	Tin	1	U		UG/L	DNT-014-06	
4GW03401VA	LF3-09	Toluene	1	U		UG/L	DMG-203-05	
4GW03401VA	LF3-09	trans-1,2-Dichloroethylene	1	U		UG/L	DMG-203-05	
4GW03401VA	LF3-09	trans-1,3-Dichloropropylene	1	U		UG/L	DMG-203-05	
4GW03401VA	LF3-09	Trichloroethylene	1	U		UG/L	DMG-203-05	
4GW03401VA	LF3-09	Trichlorofluoromethane	1	U		UG/L	DMG-203-05	
4GW03401VA	LF3-09	Trichlorotrifluoroethane	5	U		UG/L	DMG-203-05	
4GW03401C1	LF3-09	Vanadium	2	U		UG/L	DNT-014-06	
4GW03401VA	LF3-09	Vinyl Chloride	1	U		UG/L	DMG-203-05	
4GW03401VA	LF3-09	Xylene (Total)	1	U		UG/L	DMG-203-05	
4GW03401C1	LF3-09	Zinc	551			UG/L	DNT-014-06	
4GW04101VA	TRIP BLANK	1,1,1-Trichloroethane	1	U		UG/L	DMG-203-05	
4GW04301VA	FIELD BLANK	1,1,1-Trichloroethane	1	U		UG/L	DMG-203-05	
4GW04401VA	EQUIP RINSATE	1,1,1-Trichloroethane	1	U		UG/L	DMG-203-05	
4GW06701VA	TRIP BLANK	1,1,1-Trichloroethane	1	U		UG/L	JGJ-007-06	
4GW06801VA	FIELD BLANK	1,1,1-Trichloroethane	1	U		UG/L	JGJ-007-06	
4GW06901VA	EQUIP RINSATE	1,1,1-Trichloroethane	1	U		UG/L	JGJ-007-06	
4GW04101VA	TRIP BLANK	1,1,2,2-Tetrachloroethane	1	U		UG/L	DMG-203-05	
4GW04301VA	FIELD BLANK	1,1,2,2-Tetrachloroethane	1	U		UG/L	DMG-203-05	
4GW04401VA	EQUIP RINSATE	1,1,2,2-Tetrachloroethane	1	U		UG/L	DMG-203-05	
4GW06701VA	TRIP BLANK	1,1,2,2-Tetrachloroethane	1	U		UG/L	JGJ-007-06	
4GW06801VA	FIELD BLANK	1,1,2,2-Tetrachloroethane	1	U		UG/L	JGJ-007-06	
4GW06901VA	EQUIP RINSATE	1,1,2,2-Tetrachloroethane	1	U		UG/L	JGJ-007-06	

Table A-2. (continued).

Field Sample		Compound	Sample Result	Result Qualifier	Validation Flag	Sample Units	L&V Report Number
Number	Location						
4GW04101VA	TRIP BLANK	1,1,2-Trichloroethane	1	U		UG/L	DMG-203-05
4GW04301VA	FIELD BLANK	1,1,2-Trichloroethane	1	U		UG/L	DMG-203-05
4GW04401VA	EQUIP RINSATE	1,1,2-Trichloroethane	1	U		UG/L	DMG-203-05
4GW06701VA	TRIP BLANK	1,1,2-Trichloroethane	1	U		UG/L	JGJ-007-06
4GW06801VA	FIELD BLANK	1,1,2-Trichloroethane	1	U		UG/L	JGJ-007-06
4GW06901VA	EQUIP RINSATE	1,1,2-Trichloroethane	1	U		UG/L	JGJ-007-06
4GW04101VA	TRIP BLANK	1,1-Dichloroethane	1	U		UG/L	DMG-203-05
4GW04301VA	FIELD BLANK	1,1-Dichloroethane	1	U		UG/L	DMG-203-05
4GW04401VA	EQUIP RINSATE	1,1-Dichloroethane	1	U		UG/L	DMG-203-05
4GW06701VA	TRIP BLANK	1,1-Dichloroethane	1	U		UG/L	JGJ-007-06
4GW06801VA	FIELD BLANK	1,1-Dichloroethane	1	U		UG/L	JGJ-007-06
4GW06901VA	EQUIP RINSATE	1,1-Dichloroethane	1	U		UG/L	JGJ-007-06
4GW04101VA	TRIP BLANK	1,1-Dichloroethylene	1	U		UG/L	DMG-203-05
4GW04301VA	FIELD BLANK	1,1-Dichloroethylene	1	U		UG/L	DMG-203-05
4GW04401VA	EQUIP RINSATE	1,1-Dichloroethylene	1	U		UG/L	DMG-203-05
4GW06701VA	TRIP BLANK	1,1-Dichloroethylene	1	U		UG/L	JGJ-007-06
4GW06801VA	FIELD BLANK	1,1-Dichloroethylene	1	U		UG/L	JGJ-007-06
4GW06901VA	EQUIP RINSATE	1,1-Dichloroethylene	1	U		UG/L	JGJ-007-06
4GW04101VA	TRIP BLANK	1,2,4-Trichlorobenzene	1	U		UG/L	DMG-203-05
4GW04301VA	FIELD BLANK	1,2,4-Trichlorobenzene	1	U		UG/L	DMG-203-05
4GW04401VA	EQUIP RINSATE	1,2,4-Trichlorobenzene	1	U		UG/L	DMG-203-05
4GW06701VA	TRIP BLANK	1,2,4-Trichlorobenzene	1	U		UG/L	JGJ-007-06
4GW06801VA	FIELD BLANK	1,2,4-Trichlorobenzene	1	U		UG/L	JGJ-007-06
4GW06901VA	EQUIP RINSATE	1,2,4-Trichlorobenzene	1	U		UG/L	JGJ-007-06
4GW04101VA	TRIP BLANK	1,2,4-Trimethylbenzene	1	U		UG/L	DMG-203-05
4GW04301VA	FIELD BLANK	1,2,4-Trimethylbenzene	1	U		UG/L	DMG-203-05
4GW04401VA	EQUIP RINSATE	1,2,4-Trimethylbenzene	1	U		UG/L	DMG-203-05
4GW06701VA	TRIP BLANK	1,2,4-Trimethylbenzene	1	U		UG/L	JGJ-007-06
4GW06801VA	FIELD BLANK	1,2,4-Trimethylbenzene	1	U		UG/L	JGJ-007-06
4GW06901VA	EQUIP RINSATE	1,2,4-Trimethylbenzene	1	U		UG/L	JGJ-007-06
4GW04101VA	TRIP BLANK	1,2-Dibromo-3-chloropropane	1	U		UG/L	DMG-203-05
4GW04301VA	FIELD BLANK	1,2-Dibromo-3-chloropropane	1	U		UG/L	DMG-203-05
4GW04401VA	EQUIP RINSATE	1,2-Dibromo-3-chloropropane	1	U		UG/L	DMG-203-05
4GW06701VA	TRIP BLANK	1,2-Dibromo-3-chloropropane	1	U		UG/L	JGJ-007-06
4GW06801VA	FIELD BLANK	1,2-Dibromo-3-chloropropane	1	U		UG/L	JGJ-007-06
4GW06901VA	EQUIP RINSATE	1,2-Dibromo-3-chloropropane	1	U		UG/L	JGJ-007-06
4GW04101VA	TRIP BLANK	1,2-Dibromo-3-chloropropane	1	U		UG/L	DMG-203-05
4GW04301VA	FIELD BLANK	1,2-Dibromo-3-chloropropane	1	U		UG/L	DMG-203-05
4GW04401VA	EQUIP RINSATE	1,2-Dibromo-3-chloropropane	1	U		UG/L	DMG-203-05
4GW06701VA	TRIP BLANK	1,2-Dibromo-3-chloropropane	1	U		UG/L	JGJ-007-06
4GW06801VA	FIELD BLANK	1,2-Dibromo-3-chloropropane	1	U		UG/L	JGJ-007-06
4GW06901VA	EQUIP RINSATE	1,2-Dibromo-3-chloropropane	1	U		UG/L	JGJ-007-06
4GW04101VA	TRIP BLANK	1,2-Dibromoethane	1	U		UG/L	DMG-203-05
4GW04301VA	FIELD BLANK	1,2-Dibromoethane	1	U		UG/L	DMG-203-05
4GW04401VA	EQUIP RINSATE	1,2-Dibromoethane	1	U		UG/L	DMG-203-05
4GW06701VA	TRIP BLANK	1,2-Dibromoethane	1	U		UG/L	JGJ-007-06
4GW06801VA	FIELD BLANK	1,2-Dibromoethane	1	U		UG/L	JGJ-007-06
4GW06901VA	EQUIP RINSATE	1,2-Dibromoethane	1	U		UG/L	JGJ-007-06
4GW04101VA	TRIP BLANK	1,2-Dichlorobenzene	1	U		UG/L	DMG-203-05
4GW04301VA	FIELD BLANK	1,2-Dichlorobenzene	1	U		UG/L	DMG-203-05
4GW04401VA	EQUIP RINSATE	1,2-Dichlorobenzene	1	U		UG/L	DMG-203-05
4GW06701VA	TRIP BLANK	1,2-Dichlorobenzene	1	U		UG/L	JGJ-007-06
4GW06801VA	FIELD BLANK	1,2-Dichlorobenzene	1	U		UG/L	JGJ-007-06
4GW06901VA	EQUIP RINSATE	1,2-Dichlorobenzene	1	U		UG/L	JGJ-007-06
4GW04101VA	TRIP BLANK	1,2-Dichloroethane	1	U		UG/L	DMG-203-05
4GW04301VA	FIELD BLANK	1,2-Dichloroethane	1	U		UG/L	DMG-203-05
4GW04401VA	EQUIP RINSATE	1,2-Dichloroethane	1	U		UG/L	DMG-203-05
4GW06701VA	TRIP BLANK	1,2-Dichloroethane	1	U		UG/L	JGJ-007-06
4GW06801VA	FIELD BLANK	1,2-Dichloroethane	1	U		UG/L	JGJ-007-06
4GW06901VA	EQUIP RINSATE	1,2-Dichloroethane	1	U		UG/L	JGJ-007-06
4GW04101VA	TRIP BLANK	1,2-Dichloropropane	1	U		UG/L	DMG-203-05
4GW04301VA	FIELD BLANK	1,2-Dichloropropane	1	U		UG/L	DMG-203-05
4GW04401VA	EQUIP RINSATE	1,2-Dichloropropane	1	U		UG/L	DMG-203-05
4GW06701VA	TRIP BLANK	1,2-Dichloropropane	1	U		UG/L	JGJ-007-06
4GW06801VA	FIELD BLANK	1,2-Dichloropropane	1	U		UG/L	JGJ-007-06
4GW06901VA	EQUIP RINSATE	1,2-Dichloropropane	1	U		UG/L	JGJ-007-06
4GW04101VA	TRIP BLANK	1,3,5-Trimethylbenzene	1	U		UG/L	DMG-203-05
4GW04301VA	FIELD BLANK	1,3,5-Trimethylbenzene	1	U		UG/L	DMG-203-05

Table A-2. (continued).

Field Sample		Compound	Sample Result	Result Qualifier	Validation Flag	Sample Units	L&V Report Number
Number	Location						
4GW04401VA	EQUIP RINSATE	1,3,5-Trimethylbenzene	1	U		UG/L	DMG-203-05
4GW06701VA	TRIP BLANK	1,3,5-Trimethylbenzene	1	U		UG/L	JGJ-007-06
4GW06801VA	FIELD BLANK	1,3,5-Trimethylbenzene	1	U		UG/L	JGJ-007-06
4GW06901VA	EQUIP RINSATE	1,3,5-Trimethylbenzene	1	U		UG/L	JGJ-007-06
4GW04101VA	TRIP BLANK	1,3-Dichlorobenzene	1	U		UG/L	DMG-203-05
4GW04301VA	FIELD BLANK	1,3-Dichlorobenzene	1	U		UG/L	DMG-203-05
4GW04401VA	EQUIP RINSATE	1,3-Dichlorobenzene	1	U		UG/L	DMG-203-05
4GW06701VA	TRIP BLANK	1,3-Dichlorobenzene	1	U		UG/L	JGJ-007-06
4GW06801VA	FIELD BLANK	1,3-Dichlorobenzene	1	U		UG/L	JGJ-007-06
4GW06901VA	EQUIP RINSATE	1,3-Dichlorobenzene	1	U		UG/L	JGJ-007-06
4GW04101VA	TRIP BLANK	1,4-Dichlorobenzene	1	U		UG/L	DMG-203-05
4GW04301VA	FIELD BLANK	1,4-Dichlorobenzene	1	U		UG/L	DMG-203-05
4GW04401VA	EQUIP RINSATE	1,4-Dichlorobenzene	1	U		UG/L	DMG-203-05
4GW06701VA	TRIP BLANK	1,4-Dichlorobenzene	1	U		UG/L	JGJ-007-06
4GW06801VA	FIELD BLANK	1,4-Dichlorobenzene	1	U		UG/L	JGJ-007-06
4GW06901VA	EQUIP RINSATE	1,4-Dichlorobenzene	1	U		UG/L	JGJ-007-06
4GW04101VA	TRIP BLANK	2-Butanone	5	U		UG/L	DMG-203-05
4GW04301VA	FIELD BLANK	2-Butanone	5	U		UG/L	DMG-203-05
4GW04401VA	EQUIP RINSATE	2-Butanone	5	U		UG/L	DMG-203-05
4GW06701VA	TRIP BLANK	2-Butanone	5	U		UG/L	JGJ-007-06
4GW06801VA	FIELD BLANK	2-Butanone	5	U		UG/L	JGJ-007-06
4GW06901VA	EQUIP RINSATE	2-Butanone	5	U		UG/L	JGJ-007-06
4GW04101VA	TRIP BLANK	2-Chloroethyl vinyl ether	5	U		UG/L	DMG-203-05
4GW04301VA	FIELD BLANK	2-Chloroethyl vinyl ether	5	U		UG/L	DMG-203-05
4GW04401VA	EQUIP RINSATE	2-Chloroethyl vinyl ether	5	U		UG/L	DMG-203-05
4GW06701VA	TRIP BLANK	2-Chloroethyl vinyl ether	5	U		UG/L	JGJ-007-06
4GW06801VA	FIELD BLANK	2-Chloroethyl vinyl ether	5	U		UG/L	JGJ-007-06
4GW06901VA	EQUIP RINSATE	2-Chloroethyl vinyl ether	5	U		UG/L	JGJ-007-06
4GW04101VA	TRIP BLANK	2-Hexanone	5	U		UG/L	DMG-203-05
4GW04301VA	FIELD BLANK	2-Hexanone	5	U		UG/L	DMG-203-05
4GW04401VA	EQUIP RINSATE	2-Hexanone	5	U		UG/L	DMG-203-05
4GW06701VA	TRIP BLANK	2-Hexanone	5	U		UG/L	JGJ-007-06
4GW06801VA	FIELD BLANK	2-Hexanone	5	U		UG/L	JGJ-007-06
4GW06901VA	EQUIP RINSATE	2-Hexanone	5	U		UG/L	JGJ-007-06
4GW04101VA	TRIP BLANK	4-Methyl-2-pentanone	5	U		UG/L	DMG-203-05
4GW04301VA	FIELD BLANK	4-Methyl-2-pentanone	5	U		UG/L	DMG-203-05
4GW04401VA	EQUIP RINSATE	4-Methyl-2-pentanone	5	U		UG/L	DMG-203-05
4GW06701VA	TRIP BLANK	4-Methyl-2-pentanone	5	U		UG/L	JGJ-007-06
4GW06801VA	FIELD BLANK	4-Methyl-2-pentanone	5	U		UG/L	JGJ-007-06
4GW06901VA	EQUIP RINSATE	4-Methyl-2-pentanone	5	U		UG/L	JGJ-007-06
4GW04101VA	TRIP BLANK	Acetone	5	U		UG/L	DMG-203-05
4GW04301VA	FIELD BLANK	Acetone	5	U		UG/L	DMG-203-05
4GW04401VA	EQUIP RINSATE	Acetone	5	U		UG/L	DMG-203-05
4GW06701VA	TRIP BLANK	Acetone	5	U		UG/L	JGJ-007-06
4GW06801VA	FIELD BLANK	Acetone	5	U		UG/L	JGJ-007-06
4GW06901VA	EQUIP RINSATE	Acetone	5	U		UG/L	JGJ-007-06
4GW04101VA	TRIP BLANK	Acetonitrile	25	U	R	UG/L	DMG-203-05
4GW04301VA	FIELD BLANK	Acetonitrile	25	U	R	UG/L	DMG-203-05
4GW04401VA	EQUIP RINSATE	Acetonitrile	25	U	R	UG/L	DMG-203-05
4GW06701VA	TRIP BLANK	Acetonitrile	25	U	R	UG/L	JGJ-007-06
4GW06801VA	FIELD BLANK	Acetonitrile	25	U	R	UG/L	JGJ-007-06
4GW06901VA	EQUIP RINSATE	Acetonitrile	25	U	R	UG/L	JGJ-007-06
4GW04301A1	FIELD BLANK	Alkalinity, Total as CaCO ₃	1	U		MG/L	DNT-464-05
4GW04401A1	EQUIP RINSATE	Alkalinity, Total as CaCO ₃	0	U		MG/L	DNT-464-05
4GW06801A1	FIELD BLANK	Alkalinity, Total as CaCO ₃	2.02	J		MG/L	DNT-017-06
4GW06901A1	EQUIP RINSATE	Alkalinity, Total as CaCO ₃	2.02	J		MG/L	DNT-017-06
4GW04301C1	FIELD BLANK	Antimony	0.5	U		UG/L	DNT-014-06
4GW04401C1	EQUIP RINSATE	Antimony	0.5	U		UG/L	DNT-014-06
4GW06801C1	FIELD BLANK	Antimony	0.5	U		UG/L	DNT-015-06
4GW06901C1	EQUIP RINSATE	Antimony	0.5	U		UG/L	DNT-015-06
4GW04301C1	FIELD BLANK	Arsenic	1.5	U		UG/L	DNT-014-06
4GW04401C1	EQUIP RINSATE	Arsenic	1.5	U		UG/L	DNT-014-06

Table A-2. (continued).

Field Sample		Compound	Sample Result	Result Qualifier	Validation Flag	Sample Units	L&V Report Number
Number	Location						
4GW06801C1	FIELD BLANK	Arsenic	1.5	U		UG/L	DNT-015-06
4GW06901C1	EQUIP RINSATE	Arsenic	1.5	U		UG/L	DNT-015-06
4GW04301C1	FIELD BLANK	Barium	0.5	U		UG/L	DNT-014-06
4GW04401C1	EQUIP RINSATE	Barium	0.5	U		UG/L	DNT-014-06
4GW06801C1	FIELD BLANK	Barium	0.5	U		UG/L	DNT-015-06
4GW06901C1	EQUIP RINSATE	Barium	0.5	U		UG/L	DNT-015-06
4GW04101VA	TRIP BLANK	Benzene	1	U		UG/L	DMG-203-05
4GW04301VA	FIELD BLANK	Benzene	1	U		UG/L	DMG-203-05
4GW04401VA	EQUIP RINSATE	Benzene	1	U		UG/L	DMG-203-05
4GW06701VA	TRIP BLANK	Benzene	1	U		UG/L	JGJ-007-06
4GW06801VA	FIELD BLANK	Benzene	1	U		UG/L	JGJ-007-06
4GW06901VA	EQUIP RINSATE	Benzene	1	U		UG/L	JGJ-007-06
4GW04301C1	FIELD BLANK	Beryllium	0.1	U		UG/L	DNT-014-06
4GW04401C1	EQUIP RINSATE	Beryllium	0.1	U		UG/L	DNT-014-06
4GW06801C1	FIELD BLANK	Beryllium	0.1	U		UG/L	DNT-015-06
4GW06901C1	EQUIP RINSATE	Beryllium	0.1	U		UG/L	DNT-015-06
4GW04101VA	TRIP BLANK	Bromodichloromethane	1	U		UG/L	DMG-203-05
4GW04301VA	FIELD BLANK	Bromodichloromethane	1	U		UG/L	DMG-203-05
4GW04401VA	EQUIP RINSATE	Bromodichloromethane	1	U		UG/L	DMG-203-05
4GW06701VA	TRIP BLANK	Bromodichloromethane	1	U		UG/L	JGJ-007-06
4GW06801VA	FIELD BLANK	Bromodichloromethane	1	U		UG/L	JGJ-007-06
4GW06901VA	EQUIP RINSATE	Bromodichloromethane	1	U		UG/L	JGJ-007-06
4GW04101VA	TRIP BLANK	Bromoform	1	U		UG/L	DMG-203-05
4GW04301VA	FIELD BLANK	Bromoform	1	U		UG/L	DMG-203-05
4GW04401VA	EQUIP RINSATE	Bromoform	1	U		UG/L	DMG-203-05
4GW06701VA	TRIP BLANK	Bromoform	1	U		UG/L	JGJ-007-06
4GW06801VA	FIELD BLANK	Bromoform	1	U		UG/L	JGJ-007-06
4GW06901VA	EQUIP RINSATE	Bromoform	1	U		UG/L	JGJ-007-06
4GW04101VA	TRIP BLANK	Bromomethane	1	U		UG/L	DMG-203-05
4GW04301VA	FIELD BLANK	Bromomethane	1	U		UG/L	DMG-203-05
4GW04401VA	EQUIP RINSATE	Bromomethane	1	U		UG/L	DMG-203-05
4GW06701VA	TRIP BLANK	Bromomethane	1	U		UG/L	JGJ-007-06
4GW06801VA	FIELD BLANK	Bromomethane	1	U		UG/L	JGJ-007-06
4GW06901VA	EQUIP RINSATE	Bromomethane	1	U		UG/L	JGJ-007-06
4GW04301C1	FIELD BLANK	Cadmium	0.1	U		UG/L	DNT-014-06
4GW04401C1	EQUIP RINSATE	Cadmium	0.1	U		UG/L	DNT-014-06
4GW06801C1	FIELD BLANK	Cadmium	0.1	U		UG/L	DNT-015-06
4GW06901C1	EQUIP RINSATE	Cadmium	0.1	U		UG/L	DNT-015-06
4GW04101VA	TRIP BLANK	Carbon disulfide	5	U		UG/L	DMG-203-05
4GW04301VA	FIELD BLANK	Carbon disulfide	5	U		UG/L	DMG-203-05
4GW04401VA	EQUIP RINSATE	Carbon disulfide	5	U		UG/L	DMG-203-05
4GW06701VA	TRIP BLANK	Carbon disulfide	5	U		UG/L	JGJ-007-06
4GW06801VA	FIELD BLANK	Carbon disulfide	5	U		UG/L	JGJ-007-06
4GW06901VA	EQUIP RINSATE	Carbon disulfide	5	U		UG/L	JGJ-007-06
4GW04101VA	TRIP BLANK	Carbon tetrachloride	1	U		UG/L	DMG-203-05
4GW04301VA	FIELD BLANK	Carbon tetrachloride	1	U		UG/L	DMG-203-05
4GW04401VA	EQUIP RINSATE	Carbon tetrachloride	1	U		UG/L	DMG-203-05
4GW06701VA	TRIP BLANK	Carbon tetrachloride	1	U		UG/L	JGJ-007-06
4GW06801VA	FIELD BLANK	Carbon tetrachloride	1	U		UG/L	JGJ-007-06
4GW06901VA	EQUIP RINSATE	Carbon tetrachloride	1	U		UG/L	JGJ-007-06
4GW04301F3	FIELD BLANK	Chloride	0	U		MG/L	DNT-016-06
4GW04401F3	EQUIP RINSATE	Chloride	0.172	J	J	MG/L	DNT-016-06
4GW06801F3	FIELD BLANK	Chloride	0.23	J		MG/L	DNT-017-06
4GW06901F3	EQUIP RINSATE	Chloride	0	U		MG/L	DNT-017-06
4GW04101VA	TRIP BLANK	Chlorobenzene	1	U		UG/L	DMG-203-05
4GW04301VA	FIELD BLANK	Chlorobenzene	1	U		UG/L	DMG-203-05
4GW04401VA	EQUIP RINSATE	Chlorobenzene	1	U		UG/L	DMG-203-05
4GW06701VA	TRIP BLANK	Chlorobenzene	1	U		UG/L	JGJ-007-06
4GW06801VA	FIELD BLANK	Chlorobenzene	1	U		UG/L	JGJ-007-06
4GW06901VA	EQUIP RINSATE	Chlorobenzene	1	U		UG/L	JGJ-007-06
4GW04101VA	TRIP BLANK	Chloroethane	1	U		UG/L	DMG-203-05
4GW04301VA	FIELD BLANK	Chloroethane	1	U		UG/L	DMG-203-05

Table A-2. (continued).

Field Sample			Sample	Result	Validation	Sample	L&V Report
Number	Location	Compound	Result	Qualifier	Flag	Units	Number
4GW04401VA	EQUIP RINSATE	Chloroethane	1	U		UG/L	DMG-203-05
4GW06701VA	TRIP BLANK	Chloroethane	1	U		UG/L	JGJ-007-06
4GW06801VA	FIELD BLANK	Chloroethane	1	U		UG/L	JGJ-007-06
4GW06901VA	EQUIP RINSATE	Chloroethane	1	U		UG/L	JGJ-007-06
4GW04101VA	TRIP BLANK	Chloroform	1	U		UG/L	DMG-203-05
4GW04301VA	FIELD BLANK	Chloroform	1	U		UG/L	DMG-203-05
4GW04401VA	EQUIP RINSATE	Chloroform	1	U		UG/L	DMG-203-05
4GW06701VA	TRIP BLANK	Chloroform	1	U		UG/L	JGJ-007-06
4GW06801VA	FIELD BLANK	Chloroform	1	U		UG/L	JGJ-007-06
4GW06901VA	EQUIP RINSATE	Chloroform	1	U		UG/L	JGJ-007-06
4GW04101VA	TRIP BLANK	Chloromethane	1	U		UG/L	DMG-203-05
4GW04301VA	FIELD BLANK	Chloromethane	1	U		UG/L	DMG-203-05
4GW04401VA	EQUIP RINSATE	Chloromethane	1	U		UG/L	DMG-203-05
4GW06701VA	TRIP BLANK	Chloromethane	1	U		UG/L	JGJ-007-06
4GW06801VA	FIELD BLANK	Chloromethane	1	U		UG/L	JGJ-007-06
4GW06901VA	EQUIP RINSATE	Chloromethane	1	U		UG/L	JGJ-007-06
4GW04301C1	FIELD BLANK	Chromium	2	B	U	UG/L	DNT-014-06
4GW04401C1	EQUIP RINSATE	Chromium	1.8	B	U	UG/L	DNT-014-06
4GW06801C1	FIELD BLANK	Chromium	1.1	B*N	R	UG/L	DNT-015-06
4GW06901C1	EQUIP RINSATE	Chromium	1.2	B*N	R	UG/L	DNT-015-06
4GW04101VA	TRIP BLANK	cis-1,2-Dichloroethylene	1	U		UG/L	DMG-203-05
4GW04301VA	FIELD BLANK	cis-1,2-Dichloroethylene	1	U		UG/L	DMG-203-05
4GW04401VA	EQUIP RINSATE	cis-1,2-Dichloroethylene	1	U		UG/L	DMG-203-05
4GW06701VA	TRIP BLANK	cis-1,2-Dichloroethylene	1	U		UG/L	JGJ-007-06
4GW06801VA	FIELD BLANK	cis-1,2-Dichloroethylene	1	U		UG/L	JGJ-007-06
4GW06901VA	EQUIP RINSATE	cis-1,2-Dichloroethylene	1	U		UG/L	JGJ-007-06
4GW04101VA	TRIP BLANK	cis-1,3-Dichloropropylene	1	U		UG/L	DMG-203-05
4GW04301VA	FIELD BLANK	cis-1,3-Dichloropropylene	1	U		UG/L	DMG-203-05
4GW04401VA	EQUIP RINSATE	cis-1,3-Dichloropropylene	1	U		UG/L	DMG-203-05
4GW06701VA	TRIP BLANK	cis-1,3-Dichloropropylene	1	U		UG/L	JGJ-007-06
4GW06801VA	FIELD BLANK	cis-1,3-Dichloropropylene	1	U		UG/L	JGJ-007-06
4GW06901VA	EQUIP RINSATE	cis-1,3-Dichloropropylene	1	U		UG/L	JGJ-007-06
4GW04301C1	FIELD BLANK	Cobalt	0.1	U		UG/L	DNT-014-06
4GW04401C1	EQUIP RINSATE	Cobalt	0.1	U		UG/L	DNT-014-06
4GW06801C1	FIELD BLANK	Cobalt	0.1	U		UG/L	DNT-015-06
4GW06901C1	EQUIP RINSATE	Cobalt	0.1	U		UG/L	DNT-015-06
4GW04301C1	FIELD BLANK	Copper	0.41	B		UG/L	DNT-014-06
4GW04401C1	EQUIP RINSATE	Copper	0.54	B		UG/L	DNT-014-06
4GW06801C1	FIELD BLANK	Copper	10.3	*	J	UG/L	DNT-015-06
4GW06901C1	EQUIP RINSATE	Copper	10.3	*	J	UG/L	DNT-015-06
4GW04101VA	TRIP BLANK	Cyclohexane	1	U		UG/L	DMG-203-05
4GW04301VA	FIELD BLANK	Cyclohexane	1	U		UG/L	DMG-203-05
4GW04401VA	EQUIP RINSATE	Cyclohexane	1	U		UG/L	DMG-203-05
4GW06701VA	TRIP BLANK	Cyclohexane	1	U		UG/L	JGJ-007-06
4GW06801VA	FIELD BLANK	Cyclohexane	1	U		UG/L	JGJ-007-06
4GW06901VA	EQUIP RINSATE	Cyclohexane	1	U		UG/L	JGJ-007-06
4GW04101VA	TRIP BLANK	Dibromochloromethane	1	U		UG/L	DMG-203-05
4GW04301VA	FIELD BLANK	Dibromochloromethane	1	U		UG/L	DMG-203-05
4GW04401VA	EQUIP RINSATE	Dibromochloromethane	1	U		UG/L	DMG-203-05
4GW06701VA	TRIP BLANK	Dibromochloromethane	1	U		UG/L	JGJ-007-06
4GW06801VA	FIELD BLANK	Dibromochloromethane	1	U		UG/L	JGJ-007-06
4GW06901VA	EQUIP RINSATE	Dibromochloromethane	1	U		UG/L	JGJ-007-06
4GW04101VA	TRIP BLANK	Dichlorodifluoromethane	1	U		UG/L	DMG-203-05
4GW04301VA	FIELD BLANK	Dichlorodifluoromethane	1	U		UG/L	DMG-203-05
4GW04401VA	EQUIP RINSATE	Dichlorodifluoromethane	1	U		UG/L	DMG-203-05
4GW06701VA	TRIP BLANK	Dichlorodifluoromethane	1	U		UG/L	JGJ-007-06
4GW06801VA	FIELD BLANK	Dichlorodifluoromethane	1	U		UG/L	JGJ-007-06
4GW06901VA	EQUIP RINSATE	Dichlorodifluoromethane	1	U		UG/L	JGJ-007-06
4GW04101VA	TRIP BLANK	Ethylbenzene	1	U		UG/L	DMG-203-05
4GW04301VA	FIELD BLANK	Ethylbenzene	1	U		UG/L	DMG-203-05
4GW04401VA	EQUIP RINSATE	Ethylbenzene	1	U		UG/L	DMG-203-05
4GW06701VA	TRIP BLANK	Ethylbenzene	1	U		UG/L	JGJ-007-06

Table A-2. (continued).

Field Sample			Sample	Result	Validation	Sample	L&V Report
Number	Location	Compound	Result	Qualifier	Flag	Units	Number
4GW06801VA	FIELD BLANK	Ethylbenzene	1	U		UG/L	JGJ-007-06
4GW06901VA	EQUIP RINSATE	Ethylbenzene	1	U		UG/L	JGJ-007-06
4GW04301F3	FIELD BLANK	Fluoride	0	U		MG/L	DNT-016-06
4GW04401F3	EQUIP RINSATE	Fluoride	0	U		MG/L	DNT-016-06
4GW06801F3	FIELD BLANK	Fluoride	0	U		MG/L	DNT-017-06
4GW06901F3	EQUIP RINSATE	Fluoride	0	U		MG/L	DNT-017-06
4GW04101VA	TRIP BLANK	Isopropylbenzene	1	U		UG/L	DMG-203-05
4GW04301VA	FIELD BLANK	Isopropylbenzene	1	U		UG/L	DMG-203-05
4GW04401VA	EQUIP RINSATE	Isopropylbenzene	1	U		UG/L	DMG-203-05
4GW06701VA	TRIP BLANK	Isopropylbenzene	1	U		UG/L	JGJ-007-06
4GW06801VA	FIELD BLANK	Isopropylbenzene	1	U		UG/L	JGJ-007-06
4GW06901VA	EQUIP RINSATE	Isopropylbenzene	1	U		UG/L	JGJ-007-06
4GW04301C1	FIELD BLANK	Lead	0.5	U		UG/L	DNT-014-06
4GW04401C1	EQUIP RINSATE	Lead	0.5	U		UG/L	DNT-014-06
4GW06801C1	FIELD BLANK	Lead	0.64	B		UG/L	DNT-015-06
4GW06901C1	EQUIP RINSATE	Lead	0.64	B		UG/L	DNT-015-06
4GW04301C1	FIELD BLANK	Mercury	0.092	B	U	UG/L	DNT-014-06
4GW04401C1	EQUIP RINSATE	Mercury	0.091	B	U	UG/L	DNT-014-06
4GW06801C1	FIELD BLANK	Mercury	0.05	U		UG/L	DNT-015-06
4GW06901C1	EQUIP RINSATE	Mercury	0.05	U		UG/L	DNT-015-06
4GW04101VL	TRIP BLANK	Methane	14	U		UG/L	DMG-199-05
4GW04301VL	FIELD BLANK	Methane	14	U		UG/L	DMG-199-05
4GW04401VL	EQUIP RINSATE	Methane	14	U		UG/L	DMG-199-05
4GW06701VL	TRIP BLANK	Methane	14	U		UG/L	DMG-213-05
4GW06801VL	FIELD BLANK	Methane	83.8			UG/L	DMG-213-05
4GW06901VL	EQUIP RINSATE	Methane	14	U		UG/L	DMG-213-05
4GW04101VA	TRIP BLANK	Methyl acetate	5	U		UG/L	DMG-203-05
4GW04301VA	FIELD BLANK	Methyl acetate	5	U		UG/L	DMG-203-05
4GW04401VA	EQUIP RINSATE	Methyl acetate	5	U		UG/L	DMG-203-05
4GW06701VA	TRIP BLANK	Methyl acetate	5	U		UG/L	JGJ-007-06
4GW06801VA	FIELD BLANK	Methyl acetate	5	U		UG/L	JGJ-007-06
4GW06901VA	EQUIP RINSATE	Methyl acetate	5	U		UG/L	JGJ-007-06
4GW04101VA	TRIP BLANK	Methyl cyclohexane	1	U		UG/L	DMG-203-05
4GW04301VA	FIELD BLANK	Methyl cyclohexane	1	U		UG/L	DMG-203-05
4GW04401VA	EQUIP RINSATE	Methyl cyclohexane	1	U		UG/L	DMG-203-05
4GW06701VA	TRIP BLANK	Methyl cyclohexane	1	U		UG/L	JGJ-007-06
4GW06801VA	FIELD BLANK	Methyl cyclohexane	1	U		UG/L	JGJ-007-06
4GW06901VA	EQUIP RINSATE	Methyl cyclohexane	1	U		UG/L	JGJ-007-06
4GW04101VA	TRIP BLANK	Methylene Chloride	5	U		UG/L	DMG-203-05
4GW04301VA	FIELD BLANK	Methylene Chloride	5	U		UG/L	DMG-203-05
4GW04401VA	EQUIP RINSATE	Methylene Chloride	5	U		UG/L	DMG-203-05
4GW06701VA	TRIP BLANK	Methylene Chloride	5	U		UG/L	JGJ-007-06
4GW06801VA	FIELD BLANK	Methylene Chloride	5	U		UG/L	JGJ-007-06
4GW06901VA	EQUIP RINSATE	Methylene Chloride	5	U		UG/L	JGJ-007-06
4GW04101VA	TRIP BLANK	Naphthalene	1	U		UG/L	DMG-203-05
4GW04301VA	FIELD BLANK	Naphthalene	1	U		UG/L	DMG-203-05
4GW04401VA	EQUIP RINSATE	Naphthalene	1	U		UG/L	DMG-203-05
4GW06701VA	TRIP BLANK	Naphthalene	1	U		UG/L	JGJ-007-06
4GW06801VA	FIELD BLANK	Naphthalene	1	U		UG/L	JGJ-007-06
4GW06901VA	EQUIP RINSATE	Naphthalene	1	U		UG/L	JGJ-007-06
4GW04301C1	FIELD BLANK	Nickel	0.56	B		UG/L	DNT-014-06
4GW04401C1	EQUIP RINSATE	Nickel	0.5	U		UG/L	DNT-014-06
4GW06801C1	FIELD BLANK	Nickel	0.5	U		UG/L	DNT-015-06
4GW06901C1	EQUIP RINSATE	Nickel	0.5	U		UG/L	DNT-015-06
4GW04301N2	FIELD BLANK	Nitrogen, Nitrate/Nitrite	0.0153	U		MG/L	DNT-016-06
4GW04401N2	EQUIP RINSATE	Nitrogen, Nitrate/Nitrite	0.0142	U		MG/L	DNT-016-06
4GW06801N2	FIELD BLANK	Nitrogen, Nitrate/Nitrite	-0.0324	U		MG/L	DNT-017-06
4GW06901N2	EQUIP RINSATE	Nitrogen, Nitrate/Nitrite	-0.0268	U		MG/L	DNT-017-06
4GW04301C1	FIELD BLANK	Selenium	2.5	U		UG/L	DNT-014-06
4GW04401C1	EQUIP RINSATE	Selenium	2.5	U		UG/L	DNT-014-06
4GW06801C1	FIELD BLANK	Selenium	2.5	U		UG/L	DNT-015-06
4GW06901C1	EQUIP RINSATE	Selenium	2.5	U		UG/L	DNT-015-06

Table A-2. (continued).

Field Sample			Sample	Result	Validation	Sample	L&V Report
Number	Location	Compound	Result	Qualifier	Flag	Units	Number
4GW04301C1	FIELD BLANK	Silver	0.2	U		UG/L	DNT-014-06
4GW04401C1	EQUIP RINSATE	Silver	0.2	U		UG/L	DNT-014-06
4GW06801C1	FIELD BLANK	Silver	0.2	U		UG/L	DNT-015-06
4GW06901C1	EQUIP RINSATE	Silver	0.2	U		UG/L	DNT-015-06
4GW04101VA	TRIP BLANK	Styrene	1	U		UG/L	DMG-203-05
4GW04301VA	FIELD BLANK	Styrene	1	U		UG/L	DMG-203-05
4GW04401VA	EQUIP RINSATE	Styrene	1	U		UG/L	DMG-203-05
4GW06701VA	TRIP BLANK	Styrene	1	U		UG/L	JGJ-007-06
4GW06801VA	FIELD BLANK	Styrene	1	U		UG/L	JGJ-007-06
4GW06901VA	EQUIP RINSATE	Styrene	1	U		UG/L	JGJ-007-06
4GW04301F3	FIELD BLANK	Sulfate	0	U		MG/L	DNT-016-06
4GW04401F3	EQUIP RINSATE	Sulfate	0	U		MG/L	DNT-016-06
4GW06801F3	FIELD BLANK	Sulfate	0	U		MG/L	DNT-017-06
4GW06901F3	EQUIP RINSATE	Sulfate	0	U		MG/L	DNT-017-06
4GW04101VA	TRIP BLANK	Tert-butyl methyl ether	1	U		UG/L	DMG-203-05
4GW04301VA	FIELD BLANK	Tert-butyl methyl ether	1	U		UG/L	DMG-203-05
4GW04401VA	EQUIP RINSATE	Tert-butyl methyl ether	1	U		UG/L	DMG-203-05
4GW06701VA	TRIP BLANK	Tert-butyl methyl ether	1	U		UG/L	JGJ-007-06
4GW06801VA	FIELD BLANK	Tert-butyl methyl ether	1	U		UG/L	JGJ-007-06
4GW06901VA	EQUIP RINSATE	Tert-butyl methyl ether	1	U		UG/L	JGJ-007-06
4GW04101VA	TRIP BLANK	Tetrachloroethylene	1	U		UG/L	DMG-203-05
4GW04301VA	FIELD BLANK	Tetrachloroethylene	1	U		UG/L	DMG-203-05
4GW04401VA	EQUIP RINSATE	Tetrachloroethylene	1	U		UG/L	DMG-203-05
4GW06701VA	TRIP BLANK	Tetrachloroethylene	1	U		UG/L	JGJ-007-06
4GW06801VA	FIELD BLANK	Tetrachloroethylene	1	U		UG/L	JGJ-007-06
4GW06901VA	EQUIP RINSATE	Tetrachloroethylene	1	U		UG/L	JGJ-007-06
4GW04301C1	FIELD BLANK	Thallium	0.4	U		UG/L	DNT-014-06
4GW04401C1	EQUIP RINSATE	Thallium	0.4	U		UG/L	DNT-014-06
4GW06801C1	FIELD BLANK	Thallium	0.4	U		UG/L	DNT-015-06
4GW06901C1	EQUIP RINSATE	Thallium	0.4	U		UG/L	DNT-015-06
4GW04301C1	FIELD BLANK	Tin	1	U		UG/L	DNT-014-06
4GW04401C1	EQUIP RINSATE	Tin	1	U		UG/L	DNT-014-06
4GW06801C1	FIELD BLANK	Tin	1	U		UG/L	DNT-015-06
4GW06901C1	EQUIP RINSATE	Tin	1	U		UG/L	DNT-015-06
4GW04101VA	TRIP BLANK	Toluene	1	U		UG/L	DMG-203-05
4GW04301VA	FIELD BLANK	Toluene	1	U		UG/L	DMG-203-05
4GW04401VA	EQUIP RINSATE	Toluene	1	U		UG/L	DMG-203-05
4GW06701VA	TRIP BLANK	Toluene	1	U		UG/L	JGJ-007-06
4GW06801VA	FIELD BLANK	Toluene	1	U		UG/L	JGJ-007-06
4GW06901VA	EQUIP RINSATE	Toluene	1	U		UG/L	JGJ-007-06
4GW04101VA	TRIP BLANK	trans-1,2-Dichloroethylene	1	U		UG/L	DMG-203-05
4GW04301VA	FIELD BLANK	trans-1,2-Dichloroethylene	1	U		UG/L	DMG-203-05
4GW04401VA	EQUIP RINSATE	trans-1,2-Dichloroethylene	1	U		UG/L	DMG-203-05
4GW06701VA	TRIP BLANK	trans-1,2-Dichloroethylene	1	U		UG/L	JGJ-007-06
4GW06801VA	FIELD BLANK	trans-1,2-Dichloroethylene	1	U		UG/L	JGJ-007-06
4GW06901VA	EQUIP RINSATE	trans-1,2-Dichloroethylene	1	U		UG/L	JGJ-007-06
4GW04101VA	TRIP BLANK	trans-1,3-Dichloropropylene	1	U		UG/L	DMG-203-05
4GW04301VA	FIELD BLANK	trans-1,3-Dichloropropylene	1	U		UG/L	DMG-203-05
4GW04401VA	EQUIP RINSATE	trans-1,3-Dichloropropylene	1	U		UG/L	DMG-203-05
4GW06701VA	TRIP BLANK	trans-1,3-Dichloropropylene	1	U		UG/L	JGJ-007-06
4GW06801VA	FIELD BLANK	trans-1,3-Dichloropropylene	1	U		UG/L	JGJ-007-06
4GW06901VA	EQUIP RINSATE	trans-1,3-Dichloropropylene	1	U		UG/L	JGJ-007-06
4GW04101VA	TRIP BLANK	Trichloroethylene	1	U		UG/L	DMG-203-05
4GW04301VA	FIELD BLANK	Trichloroethylene	1	U		UG/L	DMG-203-05
4GW04401VA	EQUIP RINSATE	Trichloroethylene	1	U		UG/L	DMG-203-05
4GW06701VA	TRIP BLANK	Trichloroethylene	1	U		UG/L	JGJ-007-06
4GW06801VA	FIELD BLANK	Trichloroethylene	1	U		UG/L	JGJ-007-06
4GW06901VA	EQUIP RINSATE	Trichloroethylene	1	U		UG/L	JGJ-007-06
4GW04101VA	TRIP BLANK	Trichlorofluoromethane	1	U		UG/L	DMG-203-05
4GW04301VA	FIELD BLANK	Trichlorofluoromethane	1	U		UG/L	DMG-203-05
4GW04401VA	EQUIP RINSATE	Trichlorofluoromethane	1	U		UG/L	DMG-203-05
4GW06701VA	TRIP BLANK	Trichlorofluoromethane	1	U		UG/L	JGJ-007-06

Table A-2. (continued).

Field Sample		Compound	Sample Result	Result Qualifier	Validation Flag	Sample Units	L&V Report Number
Number	Location						
4GW06801VA	FIELD BLANK	Trichlorofluoromethane	1	U		UG/L	JGJ-007-06
4GW06901VA	EQUIP RINSATE	Trichlorofluoromethane	1	U		UG/L	JGJ-007-06
4GW04101VA	TRIP BLANK	Trichlorotrifluoroethane	5	U		UG/L	DMG-203-05
4GW04301VA	FIELD BLANK	Trichlorotrifluoroethane	5	U		UG/L	DMG-203-05
4GW04401VA	EQUIP RINSATE	Trichlorotrifluoroethane	5	U		UG/L	DMG-203-05
4GW06701VA	TRIP BLANK	Trichlorotrifluoroethane	5	U		UG/L	JGJ-007-06
4GW06801VA	FIELD BLANK	Trichlorotrifluoroethane	5	U		UG/L	JGJ-007-06
4GW06901VA	EQUIP RINSATE	Trichlorotrifluoroethane	5	U		UG/L	JGJ-007-06
4GW04301C1	FIELD BLANK	Vanadium	2	U		UG/L	DNT-014-06
4GW04401C1	EQUIP RINSATE	Vanadium	2	U		UG/L	DNT-014-06
4GW06801C1	FIELD BLANK	Vanadium	2	U		UG/L	DNT-015-06
4GW06901C1	EQUIP RINSATE	Vanadium	2	U		UG/L	DNT-015-06
4GW04101VA	TRIP BLANK	Vinyl Chloride	1	U		UG/L	DMG-203-05
4GW04301VA	FIELD BLANK	Vinyl Chloride	1	U		UG/L	DMG-203-05
4GW04401VA	EQUIP RINSATE	Vinyl Chloride	1	U		UG/L	DMG-203-05
4GW06701VA	TRIP BLANK	Vinyl Chloride	1	U		UG/L	JGJ-007-06
4GW06801VA	FIELD BLANK	Vinyl Chloride	1	U		UG/L	JGJ-007-06
4GW06901VA	EQUIP RINSATE	Vinyl Chloride	1	U		UG/L	JGJ-007-06
4GW04101VA	TRIP BLANK	Xylene (Total)	1	U		UG/L	DMG-203-05
4GW04301VA	FIELD BLANK	Xylene (Total)	1	U		UG/L	DMG-203-05
4GW04401VA	EQUIP RINSATE	Xylene (Total)	1	U		UG/L	DMG-203-05
4GW06701VA	TRIP BLANK	Xylene (Total)	1	U		UG/L	JGJ-007-06
4GW06801VA	FIELD BLANK	Xylene (Total)	1	U		UG/L	JGJ-007-06
4GW06901VA	EQUIP RINSATE	Xylene (Total)	1	U		UG/L	JGJ-007-06
4GW04301C1	FIELD BLANK	Zinc	2	U		UG/L	DNT-014-06
4GW04401C1	EQUIP RINSATE	Zinc	2	U		UG/L	DNT-014-06
4GW06801C1	FIELD BLANK	Zinc	20.9			UG/L	DNT-015-06
4GW06901C1	EQUIP RINSATE	Zinc	22			UG/L	DNT-015-06
4GW03901VA	USGS-083	1,1,1-Trichloroethane	1	U		UG/L	DMG-203-05
4GW03902VA	USGS-083	1,1,1-Trichloroethane	1	U		UG/L	DMG-203-05
4GW03901VA	USGS-083	1,1,2,2-Tetrachloroethane	1	U		UG/L	DMG-203-05
4GW03902VA	USGS-083	1,1,2,2-Tetrachloroethane	1	U		UG/L	DMG-203-05
4GW03901VA	USGS-083	1,1,2-Trichloroethane	1	U		UG/L	DMG-203-05
4GW03902VA	USGS-083	1,1,2-Trichloroethane	1	U		UG/L	DMG-203-05
4GW03901VA	USGS-083	1,1-Dichloroethane	1	U		UG/L	DMG-203-05
4GW03902VA	USGS-083	1,1-Dichloroethane	1	U		UG/L	DMG-203-05
4GW03901VA	USGS-083	1,1-Dichloroethylene	1	U		UG/L	DMG-203-05
4GW03902VA	USGS-083	1,1-Dichloroethylene	1	U		UG/L	DMG-203-05
4GW03901VA	USGS-083	1,2,4-Trichlorobenzene	1	U		UG/L	DMG-203-05
4GW03902VA	USGS-083	1,2,4-Trichlorobenzene	1	U		UG/L	DMG-203-05
4GW03901VA	USGS-083	1,2,4-Trimethylbenzene	1	U		UG/L	DMG-203-05
4GW03902VA	USGS-083	1,2,4-Trimethylbenzene	1	U		UG/L	DMG-203-05
4GW03901VA	USGS-083	1,2-Dibromo-3-chloropropane	1	U		UG/L	DMG-203-05
4GW03902VA	USGS-083	1,2-Dibromo-3-chloropropane	1	U		UG/L	DMG-203-05
4GW03901VA	USGS-083	1,2-Dibromoethane	1	U		UG/L	DMG-203-05
4GW03902VA	USGS-083	1,2-Dibromoethane	1	U		UG/L	DMG-203-05
4GW03901VA	USGS-083	1,2-Dichlorobenzene	1	U		UG/L	DMG-203-05
4GW03902VA	USGS-083	1,2-Dichlorobenzene	1	U		UG/L	DMG-203-05
4GW03901VA	USGS-083	1,2-Dichloroethane	1	U		UG/L	DMG-203-05
4GW03902VA	USGS-083	1,2-Dichloroethane	1	U		UG/L	DMG-203-05
4GW03901VA	USGS-083	1,2-Dichloropropene	1	U		UG/L	DMG-203-05
4GW03902VA	USGS-083	1,2-Dichloropropene	1	U		UG/L	DMG-203-05
4GW03901VA	USGS-083	1,2-Dichloropropene	1	U		UG/L	DMG-203-05
4GW03902VA	USGS-083	1,3,5-Trimethylbenzene	1	U		UG/L	DMG-203-05
4GW03902VA	USGS-083	1,3,5-Trimethylbenzene	1	U		UG/L	DMG-203-05
4GW03901VA	USGS-083	1,3-Dichlorobenzene	1	U		UG/L	DMG-203-05
4GW03902VA	USGS-083	1,3-Dichlorobenzene	1	U		UG/L	DMG-203-05
4GW03901VA	USGS-083	1,4-Dichlorobenzene	1	U		UG/L	DMG-203-05
4GW03902VA	USGS-083	1,4-Dichlorobenzene	1	U		UG/L	DMG-203-05
4GW03901VA	USGS-083	2-Butanone	5	U		UG/L	DMG-203-05
4GW03902VA	USGS-083	2-Butanone	5	U		UG/L	DMG-203-05
4GW03901VA	USGS-083	2-Chloroethyl vinyl ether	5	U		UG/L	DMG-203-05
4GW03902VA	USGS-083	2-Chloroethyl vinyl ether	5	U		UG/L	DMG-203-05

Table A-2. (continued).

Field Sample			Sample	Result	Validation	Sample	L&V Report
Number	Location	Compound	Result	Qualifier	Flag	Units	Number
4GW03901VA	USGS-083	2-Hexanone	5	U		UG/L	DMG-203-05
4GW03902VA	USGS-083	2-Hexanone	5	U		UG/L	DMG-203-05
4GW03901VA	USGS-083	4-Methyl-2-pentanone	5	U		UG/L	DMG-203-05
4GW03902VA	USGS-083	4-Methyl-2-pentanone	5	U		UG/L	DMG-203-05
4GW03901VA	USGS-083	Acetone	5	U		UG/L	DMG-203-05
4GW03902VA	USGS-083	Acetone	5	U		UG/L	DMG-203-05
4GW03901VA	USGS-083	Acetonitrile	25	U	R	UG/L	DMG-203-05
4GW03902VA	USGS-083	Acetonitrile	25	U	R	UG/L	DMG-203-05
4GW03901A1	USGS-083	Alkalinity, Total as CaCO ₃	88.2			MG/L	DNT-464-05
4GW03902A1	USGS-083	Alkalinity, Total as CaCO ₃	90.2			MG/L	DNT-464-05
4GW03901C1	USGS-083	Antimony	0.5	U		UG/L	DNT-014-06
4GW03902C1	USGS-083	Antimony	0.5	U		UG/L	DNT-014-06
4GW03901C1	USGS-083	Arsenic	2.4	B		UG/L	DNT-014-06
4GW03902C1	USGS-083	Arsenic	2	B		UG/L	DNT-014-06
4GW03901C1	USGS-083	Barium	27.8	B		UG/L	DNT-014-06
4GW03902C1	USGS-083	Barium	27.5	B		UG/L	DNT-014-06
4GW03901VA	USGS-083	Benzene	1	U		UG/L	DMG-203-05
4GW03902VA	USGS-083	Benzene	1	U		UG/L	DMG-203-05
4GW03901C1	USGS-083	Beryllium	0.1	U		UG/L	DNT-014-06
4GW03902C1	USGS-083	Beryllium	0.1	U		UG/L	DNT-014-06
4GW03901VA	USGS-083	Bromodichloromethane	1	U		UG/L	DMG-203-05
4GW03902VA	USGS-083	Bromodichloromethane	1	U		UG/L	DMG-203-05
4GW03901VA	USGS-083	Bromoform	1	U		UG/L	DMG-203-05
4GW03902VA	USGS-083	Bromoform	1	U		UG/L	DMG-203-05
4GW03901VA	USGS-083	Bromomethane	1	U		UG/L	DMG-203-05
4GW03902VA	USGS-083	Bromomethane	1	U		UG/L	DMG-203-05
4GW03901C1	USGS-083	Cadmium	0.1	U		UG/L	DNT-014-06
4GW03902C1	USGS-083	Cadmium	0.1	U		UG/L	DNT-014-06
4GW03901VA	USGS-083	Carbon disulfide	5	U		UG/L	DMG-203-05
4GW03902VA	USGS-083	Carbon disulfide	5	U		UG/L	DMG-203-05
4GW03901VA	USGS-083	Carbon tetrachloride	1	U		UG/L	DMG-203-05
4GW03902VA	USGS-083	Carbon tetrachloride	1	U		UG/L	DMG-203-05
4GW03901F3	USGS-083	Chloride	10.9		J	MG/L	DNT-016-06
4GW03902F3	USGS-083	Chloride	10.9		J	MG/L	DNT-016-06
4GW03901VA	USGS-083	Chlorobenzene	1	U		UG/L	DMG-203-05
4GW03902VA	USGS-083	Chlorobenzene	1	U		UG/L	DMG-203-05
4GW03901VA	USGS-083	Chloroethane	1	U		UG/L	DMG-203-05
4GW03902VA	USGS-083	Chloroethane	1	U		UG/L	DMG-203-05
4GW03901VA	USGS-083	Chloroform	1	U		UG/L	DMG-203-05
4GW03902VA	USGS-083	Chloroform	1	U		UG/L	DMG-203-05
4GW03901VA	USGS-083	Chloromethane	1	U		UG/L	DMG-203-05
4GW03902VA	USGS-083	Chloromethane	1	U		UG/L	DMG-203-05
4GW03901C1	USGS-083	Chromium	12.9			UG/L	DNT-014-06
4GW03902C1	USGS-083	Chromium	12.4			UG/L	DNT-014-06
4GW03901VA	USGS-083	cis-1,2-Dichloroethylene	1	U		UG/L	DMG-203-05
4GW03902VA	USGS-083	cis-1,2-Dichloroethylene	1	U		UG/L	DMG-203-05
4GW03901VA	USGS-083	cis-1,3-Dichloropropylene	1	U		UG/L	DMG-203-05
4GW03902VA	USGS-083	cis-1,3-Dichloropropylene	1	U		UG/L	DMG-203-05
4GW03901C1	USGS-083	Cobalt	0.14	B		UG/L	DNT-014-06
4GW03902C1	USGS-083	Cobalt	0.13	B		UG/L	DNT-014-06
4GW03901C1	USGS-083	Copper	0.97	B		UG/L	DNT-014-06
4GW03902C1	USGS-083	Copper	0.85	B		UG/L	DNT-014-06
4GW03901VA	USGS-083	Cyclohexane	1	U		UG/L	DMG-203-05
4GW03902VA	USGS-083	Cyclohexane	1	U		UG/L	DMG-203-05
4GW03901VA	USGS-083	Dibromochloromethane	1	U		UG/L	DMG-203-05
4GW03902VA	USGS-083	Dibromochloromethane	1	U		UG/L	DMG-203-05
4GW03901VA	USGS-083	Dichlorodifluoromethane	1	U		UG/L	DMG-203-05
4GW03902VA	USGS-083	Dichlorodifluoromethane	1	U		UG/L	DMG-203-05
4GW03901VA	USGS-083	Ethylbenzene	1	U		UG/L	DMG-203-05
4GW03902VA	USGS-083	Ethylbenzene	1	U		UG/L	DMG-203-05
4GW03901F3	USGS-083	Fluoride	0.264	J		MG/L	DNT-016-06
4GW03902F3	USGS-083	Fluoride	0.274	J		MG/L	DNT-016-06

Table A-2. (continued).

Field Sample		Compound	Sample Result	Result Qualifier	Validation Flag	Sample Units	L&V Report Number
Number	Location						
4GW03901VA	USGS-083	Isopropylbenzene	1	U		UG/L	DMG-203-05
4GW03902VA	USGS-083	Isopropylbenzene	1	U		UG/L	DMG-203-05
4GW03901C1	USGS-083	Lead	1.3			UG/L	DNT-014-06
4GW03902C1	USGS-083	Lead	1.2			UG/L	DNT-014-06
4GW03901C1	USGS-083	Mercury	0.071	B	U	UG/L	DNT-014-06
4GW03902C1	USGS-083	Mercury	0.074	B	U	UG/L	DNT-014-06
4GW03901VL	USGS-083	Methane	14	U		UG/L	DMG-199-05
4GW03902VL	USGS-083	Methane	14	U		UG/L	DMG-199-05
4GW03901VA	USGS-083	Methyl acetate	5	U		UG/L	DMG-203-05
4GW03902VA	USGS-083	Methyl acetate	5	U		UG/L	DMG-203-05
4GW03901VA	USGS-083	Methyl cyclohexane	1	U		UG/L	DMG-203-05
4GW03902VA	USGS-083	Methyl cyclohexane	1	U		UG/L	DMG-203-05
4GW03901VA	USGS-083	Methylene Chloride	5	U		UG/L	DMG-203-05
4GW03902VA	USGS-083	Methylene Chloride	5	U		UG/L	DMG-203-05
4GW03901VA	USGS-083	Naphthalene	1	U		UG/L	DMG-203-05
4GW03902VA	USGS-083	Naphthalene	1	U		UG/L	DMG-203-05
4GW03901C1	USGS-083	Nickel	1.5	B		UG/L	DNT-014-06
4GW03902C1	USGS-083	Nickel	1	B		UG/L	DNT-014-06
4GW03901N2	USGS-083	Nitrogen, Nitrate/Nitrite	0.592			MG/L	DNT-016-06
4GW03902N2	USGS-083	Nitrogen, Nitrate/Nitrite	0.628			MG/L	DNT-016-06
4GW03901C1	USGS-083	Selenium	2.5	U		UG/L	DNT-014-06
4GW03902C1	USGS-083	Selenium	2.5	U		UG/L	DNT-014-06
4GW03901C1	USGS-083	Silver	0.2	U		UG/L	DNT-014-06
4GW03902C1	USGS-083	Silver	0.2	U		UG/L	DNT-014-06
4GW03901VA	USGS-083	Styrene	1	U		UG/L	DMG-203-05
4GW03902VA	USGS-083	Styrene	1	U		UG/L	DMG-203-05
4GW03901F3	USGS-083	Sulfate	20.2			MG/L	DNT-016-06
4GW03902F3	USGS-083	Sulfate	20			MG/L	DNT-016-06
4GW03901VA	USGS-083	Tert-butyl methyl ether	1	U		UG/L	DMG-203-05
4GW03902VA	USGS-083	Tert-butyl methyl ether	1	U		UG/L	DMG-203-05
4GW03901VA	USGS-083	Tetrachloroethylene	1	U		UG/L	DMG-203-05
4GW03902VA	USGS-083	Tetrachloroethylene	1	U		UG/L	DMG-203-05
4GW03901C1	USGS-083	Thallium	0.4	U		UG/L	DNT-014-06
4GW03902C1	USGS-083	Thallium	0.4	U		UG/L	DNT-014-06
4GW03901C1	USGS-083	Tin	1	U		UG/L	DNT-014-06
4GW03902C1	USGS-083	Tin	1	U		UG/L	DNT-014-06
4GW03901VA	USGS-083	Toluene	1	U		UG/L	DMG-203-05
4GW03902VA	USGS-083	Toluene	1	U		UG/L	DMG-203-05
4GW03901VA	USGS-083	trans-1,2-Dichloroethylene	1	U		UG/L	DMG-203-05
4GW03902VA	USGS-083	trans-1,2-Dichloroethylene	1	U		UG/L	DMG-203-05
4GW03901VA	USGS-083	trans-1,3-Dichloropropylene	1	U		UG/L	DMG-203-05
4GW03902VA	USGS-083	trans-1,3-Dichloropropylene	1	U		UG/L	DMG-203-05
4GW03901VA	USGS-083	Trichloroethylene	1	U		UG/L	DMG-203-05
4GW03902VA	USGS-083	Trichloroethylene	1	U		UG/L	DMG-203-05
4GW03901VA	USGS-083	Trichlorofluoromethane	1	U		UG/L	DMG-203-05
4GW03902VA	USGS-083	Trichlorofluoromethane	1	U		UG/L	DMG-203-05
4GW03901VA	USGS-083	Trichlorotrifluoroethane	5	U		UG/L	DMG-203-05
4GW03902VA	USGS-083	Trichlorotrifluoroethane	5	U		UG/L	DMG-203-05
4GW03901C1	USGS-083	Vanadium	8.5	B	U	UG/L	DNT-014-06
4GW03902C1	USGS-083	Vanadium	7.3	B	U	UG/L	DNT-014-06
4GW03901VA	USGS-083	Vinyl Chloride	1	U		UG/L	DMG-203-05
4GW03902VA	USGS-083	Vinyl Chloride	1	U		UG/L	DMG-203-05
4GW03901VA	USGS-083	Xylene (Total)	1	U		UG/L	DMG-203-05
4GW03902VA	USGS-083	Xylene (Total)	1	U		UG/L	DMG-203-05
4GW03901C1	USGS-083	Zinc	166			UG/L	DNT-014-06
4GW03902C1	USGS-083	Zinc	159			UG/L	DNT-014-06
4GW04001VA	USGS-128	1,1,1-Trichloroethane	1	U		UG/L	DMG-203-05
4GW04001VA	USGS-128	1,1,2,2-Tetrachloroethane	1	U		UG/L	DMG-203-05
4GW04001VA	USGS-128	1,1,2-Trichloroethane	1	U		UG/L	DMG-203-05
4GW04001VA	USGS-128	1,1-Dichloroethane	1	U		UG/L	DMG-203-05
4GW04001VA	USGS-128	1,1-Dichloroethylene	1	U		UG/L	DMG-203-05
4GW04001VA	USGS-128	1,2,4-Trichlorobenzene	1	U		UG/L	DMG-203-05

Table A-2. (continued).

Field Sample		Compound	Sample Result	Result Qualifier	Validation Flag	Sample Units	L&V Report Number
Number	Location						
4GW04001VA	USGS-128	1,2,4-Trimethylbenzene	1	U		UG/L	DMG-203-05
4GW04001VA	USGS-128	1,2-Dibromo-3-chloropropane	1	U		UG/L	DMG-203-05
4GW04001VA	USGS-128	1,2-Dibromoethane	1	U		UG/L	DMG-203-05
4GW04001VA	USGS-128	1,2-Dichlorobenzene	1	U		UG/L	DMG-203-05
4GW04001VA	USGS-128	1,2-Dichloroethane	1	U		UG/L	DMG-203-05
4GW04001VA	USGS-128	1,2-Dichloropropane	1	U		UG/L	DMG-203-05
4GW04001VA	USGS-128	1,3,5-Trimethylbenzene	1	U		UG/L	DMG-203-05
4GW04001VA	USGS-128	1,3-Dichlorobenzene	1	U		UG/L	DMG-203-05
4GW04001VA	USGS-128	1,4-Dichlorobenzene	1	U		UG/L	DMG-203-05
4GW04001VA	USGS-128	2-Butanone	5	U		UG/L	DMG-203-05
4GW04001VA	USGS-128	2-Chloroethyl vinyl ether	5	U		UG/L	DMG-203-05
4GW04001VA	USGS-128	2-Hexanone	5	U		UG/L	DMG-203-05
4GW04001VA	USGS-128	4-Methyl-2-pentanone	5	U		UG/L	DMG-203-05
4GW04001VA	USGS-128	Acetone	5	U		UG/L	DMG-203-05
4GW04001VA	USGS-128	Acetonitrile	25	U	R	UG/L	DMG-203-05
4GW04001A1	USGS-128	Alkalinity, Total as CaCO ₃	141			MG/L	DNT-464-05
4GW04001C1	USGS-128	Antimony	0.5	U		UG/L	DNT-014-06
4GW04001C1	USGS-128	Arsenic	1.5	U		UG/L	DNT-014-06
4GW04001C1	USGS-128	Barium	86.4	B		UG/L	DNT-014-06
4GW04001VA	USGS-128	Benzene	1	U		UG/L	DMG-203-05
4GW04001C1	USGS-128	Beryllium	0.1	U		UG/L	DNT-014-06
4GW04001VA	USGS-128	Bromodichloromethane	1	U		UG/L	DMG-203-05
4GW04001VA	USGS-128	Bromoform	1	U		UG/L	DMG-203-05
4GW04001VA	USGS-128	Bromomethane	1	U		UG/L	DMG-203-05
4GW04001C1	USGS-128	Cadmium	0.1	U		UG/L	DNT-014-06
4GW04001VA	USGS-128	Carbon disulfide	5	U		UG/L	DMG-203-05
4GW04001VA	USGS-128	Carbon tetrachloride	1	U		UG/L	DMG-203-05
4GW04001F3	USGS-128	Chloride	17.7		J	MG/L	DNT-016-06
4GW04001VA	USGS-128	Chlorobenzene	1	U		UG/L	DMG-203-05
4GW04001VA	USGS-128	Chloroethane	1	U		UG/L	DMG-203-05
4GW04001VA	USGS-128	Chloroform	1	U		UG/L	DMG-203-05
4GW04001VA	USGS-128	Chloromethane	1	U		UG/L	DMG-203-05
4GW04001C1	USGS-128	Chromium	21.6			UG/L	DNT-014-06
4GW04001VA	USGS-128	cis-1,2-Dichloroethylene	1	U		UG/L	DMG-203-05
4GW04001VA	USGS-128	cis-1,3-Dichloropropylene	1	U		UG/L	DMG-203-05
4GW04001C1	USGS-128	Cobalt	0.27	B		UG/L	DNT-014-06
4GW04001C1	USGS-128	Copper	3.4			UG/L	DNT-014-06
4GW04001VA	USGS-128	Cyclohexane	1	U		UG/L	DMG-203-05
4GW04001VA	USGS-128	Dibromochloromethane	1	U		UG/L	DMG-203-05
4GW04001VA	USGS-128	Dichlorodifluoromethane	1	U		UG/L	DMG-203-05
4GW04001VA	USGS-128	Ethylbenzene	1	U		UG/L	DMG-203-05
4GW04001F3	USGS-128	Fluoride	0.206	J		MG/L	DNT-016-06
4GW04001VA	USGS-128	Isopropylbenzene	1	U		UG/L	DMG-203-05
4GW04001C1	USGS-128	Lead	0.5	U		UG/L	DNT-014-06
4GW04001C1	USGS-128	Mercury	0.094	B	U	UG/L	DNT-014-06
4GW04001VL	USGS-128	Methane	14	U		UG/L	DMG-199-05
4GW04001VA	USGS-128	Methyl acetate	5	U		UG/L	DMG-203-05
4GW04001VA	USGS-128	Methyl cyclohexane	1	U		UG/L	DMG-203-05
4GW04001VA	USGS-128	Methylene Chloride	5	U		UG/L	DMG-203-05
4GW04001VA	USGS-128	Naphthalene	1	U		UG/L	DMG-203-05
4GW04001C1	USGS-128	Nickel	3.1	B		UG/L	DNT-014-06
4GW04001N2	USGS-128	Nitrogen, Nitrate/Nitrite	1.24			MG/L	DNT-016-06
4GW04001C1	USGS-128	Selenium	2.5	U		UG/L	DNT-014-06
4GW04001C1	USGS-128	Silver	0.2	U		UG/L	DNT-014-06
4GW04001VA	USGS-128	Styrene	1	U		UG/L	DMG-203-05
4GW04001F3	USGS-128	Sulfate	37.9			MG/L	DNT-016-06
4GW04001VA	USGS-128	Tert-butyl methyl ether	1	U		UG/L	DMG-203-05
4GW04001VA	USGS-128	Tetrachloroethylene	1	U		UG/L	DMG-203-05
4GW04001C1	USGS-128	Thallium	0.4	U		UG/L	DNT-014-06
4GW04001C1	USGS-128	Tin	1	U		UG/L	DNT-014-06
4GW04001VA	USGS-128	Toluene	1	U		UG/L	DMG-203-05
4GW04001VA	USGS-128	trans-1,2-Dichloroethylene	1	U		UG/L	DMG-203-05

Table A-2. (continued).

Field Sample		Compound	Sample Result	Result Qualifier	Validation Flag	Sample Units	L&V Report Number
Number	Location						
4GW04001VA	USGS-128	trans-1,3-Dichloropropylene	1	U		UG/L	DMG-203-05
4GW04001VA	USGS-128	Trichloroethylene	1	U		UG/L	DMG-203-05
4GW04001VA	USGS-128	Trichlorofluoromethane	1	U		UG/L	DMG-203-05
4GW04001VA	USGS-128	Trichlorotrifluoroethane	5	U		UG/L	DMG-203-05
4GW04001C1	USGS-128	Vanadium	2.7	B	U	UG/L	DNT-014-06
4GW04001VA	USGS-128	Vinyl Chloride	1	U		UG/L	DMG-203-05
4GW04001VA	USGS-128	Xylene (Total)	1	U		UG/L	DMG-203-05
4GW04001C1	USGS-128	Zinc	7.1	B		UG/L	DNT-014-06

Table A-3. Soil gas data.

Field Sample	Sample	Result	Validation	Sample	Organic	L&V Report			
Number	Location	Depth	Compound	Result	Qualifier	Flag	Units	TIC	Number
4VP021013A	GSP1-1	12.5	1,1,1-Trichloroethane	47			PPBV	F	JGJ-070-05
4VP021013A	GSP1-1	12.5	1,1,2,2-Tetrachloroethane	1.3	U		PPBV	F	JGJ-070-05
4VP021013A	GSP1-1	12.5	1,1,2-Trichloroethane	1.3	U		PPBV	F	JGJ-070-05
4VP021013A	GSP1-1	12.5	1,1,2-Trichlorotrifluoroethane	6.6			PPBV	F	JGJ-070-05
4VP021013A	GSP1-1	12.5	1,1-Dichloroethane	8.6			PPBV	F	JGJ-070-05
4VP021013A	GSP1-1	12.5	1,1-Dichloroethene	22			PPBV	F	JGJ-070-05
4VP021013A	GSP1-1	12.5	1,2,4-Trichlorobenzene	30			PPBV	F	JGJ-070-05
4VP021013A	GSP1-1	12.5	1,2,4-Trimethylbenzene	1.3	U		PPBV	F	JGJ-070-05
4VP021013A	GSP1-1	12.5	1,2-Dibromoethane	1.3	U		PPBV	F	JGJ-070-05
4VP021013A	GSP1-1	12.5	1,2-Dichlorobenzene	19			PPBV	F	JGJ-070-05
4VP021013A	GSP1-1	12.5	1,2-Dichloroethane	1.9			PPBV	F	JGJ-070-05
4VP021013A	GSP1-1	12.5	1,2-Dichloropropane	1.3	U		PPBV	F	JGJ-070-05
4VP021013A	GSP1-1	12.5	1,3,5-Trimethylbenzene	1.3	U		PPBV	F	JGJ-070-05
4VP021013A	GSP1-1	12.5	1,3-Dichlorobenzene	5			PPBV	F	JGJ-070-05
4VP021013A	GSP1-1	12.5	1,4-Dichlorobenzene	14			PPBV	F	JGJ-070-05
4VP021013A	GSP1-1	12.5	1-NONENE	8.9	NJ	NJ	PPBV	T	
4VP021013A	GSP1-1	12.5	1-UNDECENE, 8-METHYL-	10	NJ	NJ	PPBV	T	
4VP021013A	GSP1-1	12.5	2-Butanone	2.1			PPBV	F	JGJ-070-05
4VP021013A	GSP1-1	12.5	2-HEPTANONE, 6-METHYL-	7	NJ	NJ	PPBV	T	
4VP021013A	GSP1-1	12.5	2-Hexanone	1.1	U		PPBV	F	JGJ-070-05
4VP021013A	GSP1-1	12.5	2H-PYRAN, 3,4-DIHYDRO-6-METHYL-	3	NJ	NJ	PPBV	T	
4VP021013A	GSP1-1	12.5	2-OCTANONE	6.5	NJ	NJ	PPBV	T	
4VP021013A	GSP1-1	12.5	3-HEPTANONE	4.6	NJ	NJ	PPBV	T	
4VP021013A	GSP1-1	12.5	4-Ethyltoluene	1.3	U		PPBV	F	JGJ-070-05
4VP021013A	GSP1-1	12.5	4-Methyl-2-pentanone	1.3	U		PPBV	F	JGJ-070-05
4VP021013A	GSP1-1	12.5	4-OCTENE, (E)-	5	J	J	PPBV	T	
4VP021013A	GSP1-1	12.5	Acetone	8.6		U	PPBV	F	JGJ-070-05
4VP021013A	GSP1-1	12.5	Benzene	1.3	U		PPBV	F	JGJ-070-05
4VP021013A	GSP1-1	12.5	BENZENE, 1,2,3-TRICHLORO-	11	NJ	NJ	PPBV	T	
4VP021013A	GSP1-1	12.5	BENZENE, BUTYL-	4.7	NJ	NJ	PPBV	T	
4VP021013A	GSP1-1	12.5	Benzyl chloride	1.3	U		PPBV	F	JGJ-070-05
4VP021013A	GSP1-1	12.5	Bromomethane	1.1	U		PPBV	F	JGJ-070-05
4VP021013A	GSP1-1	12.5	BUTANE, 2-METHYL-	6	NJ	NJ	PPBV	T	
4VP021013A	GSP1-1	12.5	Carbon disulfide	1.3	U		PPBV	F	JGJ-070-05
4VP021013A	GSP1-1	12.5	Carbon tetrachloride	1.3	U		PPBV	F	JGJ-070-05
4VP021013A	GSP1-1	12.5	Chlorobenzene	7.1			PPBV	F	JGJ-070-05
4VP021013A	GSP1-1	12.5	Chloroethane	1.2	U		PPBV	F	JGJ-070-05
4VP021013A	GSP1-1	12.5	Chloroform	1.3	U		PPBV	F	JGJ-070-05
4VP021013A	GSP1-1	12.5	Chloromethane	1.3			PPBV	F	JGJ-070-05
4VP021013A	GSP1-1	12.5	cis-1,2-Dichloroethylene	1.3	U		PPBV	F	JGJ-070-05
4VP021013A	GSP1-1	12.5	cis-1,3-Dichloropropene	1.3	U		PPBV	F	JGJ-070-05
4VP021013A	GSP1-1	12.5	CYCLOPROPANE, 1-METHYL-2-OCTYL-	5.4	NJ	NJ	PPBV	T	
4VP021013A	GSP1-1	12.5	Dichlorodifluoromethane	9			PPBV	F	JGJ-070-05
4VP021013A	GSP1-1	12.5	Dichlortetrafluoroethane	1.3	U		PPBV	F	JGJ-070-05
4VP021013A	GSP1-1	12.5	Ethylbenzene	1.3	U		PPBV	F	JGJ-070-05
4VP021013A	GSP1-1	12.5	HEPTANAL	3.1	NJ	NJ	PPBV	T	
4VP021013A	GSP1-1	12.5	Hexachlorobutadiene	1.3	U		PPBV	F	JGJ-070-05
4VP021013A	GSP1-1	12.5	HEXANAL, 2-ETHYL-	4.6	NJ	NJ	PPBV	T	
4VP021013A	GSP1-1	12.5	ISOBUTANE	5.8	NJ	NJ	PPBV	T	
4VP021013A	GSP1-1	12.5	ISOPROPYL ALCOHOL	4.4	NJ	NJ	PPBV	T	
4VP021013A	GSP1-1	12.5	m,p-Xylenes	2.5	U		PPBV	F	JGJ-070-05
4VP021013A	GSP1-1	12.5	Methane	5.2		U	PPMV	F	DMG-195-05
4VP021013A	GSP1-1	12.5	Methylene Chloride	1.3	U		PPBV	F	JGJ-070-05
4VP021013A	GSP1-1	12.5	NAPHTHALENE	5.3	NJ	NJ	PPBV	T	
4VP021013A	GSP1-1	12.5	o-Xylene	1.3	U		PPBV	F	JGJ-070-05
4VP021013A	GSP1-1	12.5	PHENOL	29	NJ	NJ	PPBV	T	
4VP021013A	GSP1-1	12.5	Styrene	1.3	U		PPBV	F	JGJ-070-05
4VP021013A	GSP1-1	12.5	Tetrachloroethylene	14			PPBV	F	JGJ-070-05
4VP021013A	GSP1-1	12.5	Toluene	1.8		U	PPBV	F	JGJ-070-05
4VP021013A	GSP1-1	12.5	trans-1,2-Dichloroethene	1.3	U		PPBV	F	JGJ-070-05
4VP021013A	GSP1-1	12.5	trans-1,3-Dichloropropene	1.3	U		PPBV	F	JGJ-070-05
4VP021013A	GSP1-1	12.5	Trichloroethylene	20			PPBV	F	JGJ-070-05
4VP021013A	GSP1-1	12.5	Trichlorofluoromethane	10			PPBV	F	JGJ-070-05
4VP021013A	GSP1-1	12.5	UNDECANE	4.9	NJ	NJ	PPBV	T	
4VP021013A	GSP1-1	12.5	Vinyl Chloride	1.3	U		PPBV	F	JGJ-070-05
4VP022013A	GSP1-1	37.5	1,1,1-Trichloroethane	4300	D		PPBV	F	JGJ-070-05
4VP022013A	GSP1-1	37.5	1,1,2,2-Tetrachloroethane	1.2	U		PPBV	F	JGJ-070-05
4VP022013A	GSP1-1	37.5	1,1,2-Trichloroethane	1.2	U		PPBV	F	JGJ-070-05
4VP022013A	GSP1-1	37.5	1,1,2-Trichlorotrifluoroethane	1000	D		PPBV	F	JGJ-070-05
4VP022013A	GSP1-1	37.5	1,1-Dichloroethane	610	D		PPBV	F	JGJ-070-05
4VP022013A	GSP1-1	37.5	1,1-Dichloroethene	2700	D		PPBV	F	JGJ-070-05
4VP022013A	GSP1-1	37.5	1,2,4-Trichlorobenzene	1.2	U		PPBV	F	JGJ-070-05
4VP022013A	GSP1-1	37.5	1,2,4-Trimethylbenzene	1.2	U		PPBV	F	JGJ-070-05
4VP022013A	GSP1-1	37.5	1,2-Dibromoethane	1.2	U		PPBV	F	JGJ-070-05
4VP022013A	GSP1-1	37.5	1,2-Dichlorobenzene	1.2	U		PPBV	F	JGJ-070-05
4VP022013A	GSP1-1	37.5	1,2-Dichloroethane	35			PPBV	F	JGJ-070-05
4VP022013A	GSP1-1	37.5	1,2-Dichloropropane	9.2			PPBV	F	JGJ-070-05

Table A-3. (continued).

Field Sample	Number	Location	Depth	Compound	Sample Result	Result Qualifier	Validation Flag	Sample Units	Organic TIC	L&V Report Number
4VP022013A	GSP1-1	37.5		1,3,5-Trimethylbenzene	1.2	U		PPBV	F	JGJ-070-05
4VP022013A	GSP1-1	37.5		1,3-Dichlorobenzene	1.2	U		PPBV	F	JGJ-070-05
4VP022013A	GSP1-1	37.5		1,4-Dichlorobenzene	1.2	U		PPBV	F	JGJ-070-05
4VP022013A	GSP1-1	37.5		1-BUTENE, 2-METHYL-	17	J	J	PPBV	T	
4VP022013A	GSP1-1	37.5		1-BUTENE, 3-METHYL-	57	J	J	PPBV	T	
4VP022013A	GSP1-1	37.5		1-PROPENE, 2-METHYL-	33	NJ	NJ	PPBV	T	
4VP022013A	GSP1-1	37.5		2-Butanone	1.6			PPBV	F	JGJ-070-05
4VP022013A	GSP1-1	37.5		2-BUTENE	3.6	J	J	PPBV	T	
4VP022013A	GSP1-1	37.5		2-Hexanone	1	U		PPBV	F	JGJ-070-05
4VP022013A	GSP1-1	37.5		2-PENTENE	5.3	NJ	NJ	PPBV	T	
4VP022013A	GSP1-1	37.5		4-Ethyltoluene	1.2	U		PPBV	F	JGJ-070-05
4VP022013A	GSP1-1	37.5		4-Methyl-2-pantanone	1.2	U		PPBV	F	JGJ-070-05
4VP022013A	GSP1-1	37.5		Acetone	4.9		U	PPBV	F	JGJ-070-05
4VP022013A	GSP1-1	37.5		Benzene	1.2	U		PPBV	F	JGJ-070-05
4VP022013A	GSP1-1	37.5		Benzyl chloride	1.2	U		PPBV	F	JGJ-070-05
4VP022013A	GSP1-1	37.5		Bromomethane	1	U		PPBV	F	JGJ-070-05
4VP022013A	GSP1-1	37.5		BUTANE	60	NJ	NJ	PPBV	T	
4VP022013A	GSP1-1	37.5		BUTANE, 2-METHYL-	47	NJ	NJ	PPBV	T	
4VP022013A	GSP1-1	37.5		Carbon disulfide	1.2	U		PPBV	F	JGJ-070-05
4VP022013A	GSP1-1	37.5		Carbon tetrachloride	1.6			PPBV	F	JGJ-070-05
4VP022013A	GSP1-1	37.5		Chlorobenzene	1.2	U		PPBV	F	JGJ-070-05
4VP022013A	GSP1-1	37.5		Chloroethane	1.5			PPBV	F	JGJ-070-05
4VP022013A	GSP1-1	37.5		Chloroform	17			PPBV	F	JGJ-070-05
4VP022013A	GSP1-1	37.5		Chloromethane	1.2	U		PPBV	F	JGJ-070-05
4VP022013A	GSP1-1	37.5		cis-1,2-Dichloroethene	21			PPBV	F	JGJ-070-05
4VP022013A	GSP1-1	37.5		cis-1,3-Dichloropropene	1.2	U		PPBV	F	JGJ-070-05
4VP022013A	GSP1-1	37.5		CYCLOTETRASILOXANE, OCTAMETHYL-	5.1	NJ	R	PPBV	T	
4VP022013A	GSP1-1	37.5		CYCLOTRISILOXANE, HEXAMETHYL-	3.8	NJ	R	PPBV	T	
4VP022013A	GSP1-1	37.5		Dichlorodifluoromethane	1600	D		PPBV	F	JGJ-070-05
4VP022013A	GSP1-1	37.5		Dichlortetrafluoroethane	3			PPBV	F	JGJ-070-05
4VP022013A	GSP1-1	37.5		ETHANE, 1,2-DICHLORO-1,1,2-TRIFLUORO-	28	NJ	NJ	PPBV	T	
4VP022013A	GSP1-1	37.5		ETHANE, 1-CHLORO-1,1-DIFLUORO-	21	NJ	NJ	PPBV	T	
4VP022013A	GSP1-1	37.5		ETHENE, CHLOROTRIFLUORO-	25	NJ	NJ	PPBV	T	
4VP022013A	GSP1-1	37.5		Ethylbenzene	1.2	U		PPBV	F	JGJ-070-05
4VP022013A	GSP1-1	37.5		Hexachlorobutadiene	1.2	U		PPBV	F	JGJ-070-05
4VP022013A	GSP1-1	37.5		ISOBUTANE	66	NJ	NJ	PPBV	T	
4VP022013A	GSP1-1	37.5		m,p-Xylenes	2.3	U		PPBV	F	JGJ-070-05
4VP022013A	GSP1-1	37.5		Methane	5.25		U	PPMV	F	DMG-195-05
4VP022013A	GSP1-1	37.5		METHANE, CHLORODIFLUORO-	15	NJ	NJ	PPBV	T	
4VP022013A	GSP1-1	37.5		METHANE, DICHLOROFUORO-	74	NJ	NJ	PPBV	T	
4VP022013A	GSP1-1	37.5		Methylene Chloride	1.2			PPBV	F	JGJ-070-05
4VP022013A	GSP1-1	37.5		o-Xylene	1.2	U		PPBV	F	JGJ-070-05
4VP022013A	GSP1-1	37.5		PENTANE	49	NJ	NJ	PPBV	T	
4VP022013A	GSP1-1	37.5		PENTANE, 3-METHYL-	34	NJ	NJ	PPBV	T	
4VP022013A	GSP1-1	37.5		PENTANE, 3-METHYLENE-	4.1	NJ	NJ	PPBV	T	
4VP022013A	GSP1-1	37.5		PROPANE	39	NJ	NJ	PPBV	T	
4VP022013A	GSP1-1	37.5		Styrene	1.2	U		PPBV	F	JGJ-070-05
4VP022013A	GSP1-1	37.5		Tetrachloroethene	340	D		PPBV	F	JGJ-070-05
4VP022013A	GSP1-1	37.5		trans-1,2-Dichloroethene	1.2	U		PPBV	F	JGJ-070-05
4VP022013A	GSP1-1	37.5		trans-1,3-Dichloropropene	1.2	U		PPBV	F	JGJ-070-05
4VP022013A	GSP1-1	37.5		Trichloroethene	630	D		PPBV	F	JGJ-070-05
4VP022013A	GSP1-1	37.5		Trichlorofluoromethane	2100	D		PPBV	F	JGJ-070-05
4VP022013A	GSP1-1	37.5		Vinyl Chloride	1.2	U		PPBV	F	JGJ-070-05
4VP023013A	GSP1-1	77.5		1,1,1-Trichloroethane	2200	D		PPBV	F	JGJ-070-05
4VP023013A	GSP1-1	77.5		1,1,2,2-Tetrachloroethane	1.4	U		PPBV	F	JGJ-070-05
4VP023013A	GSP1-1	77.5		1,1,2-Trichloroethane	1.4	U		PPBV	F	JGJ-070-05
4VP023013A	GSP1-1	77.5		1,1,2-Trichlorotrifluoroethane	1200	D		PPBV	F	JGJ-070-05
4VP023013A	GSP1-1	77.5		1,1-Dichloroethane	570	D		PPBV	F	JGJ-070-05
4VP023013A	GSP1-1	77.5		1,1-Dichloroethene	1600	D		PPBV	F	JGJ-070-05
4VP023013A	GSP1-1	77.5		1,2,4-Trichlorobenzene	1.4	U		PPBV	F	JGJ-070-05
4VP023013A	GSP1-1	77.5		1,2,4-Trimethylbenzene	1.4	U		PPBV	F	JGJ-070-05
4VP023013A	GSP1-1	77.5		1,2-Dibromoethane	1.4	U		PPBV	F	JGJ-070-05
4VP023013A	GSP1-1	77.5		1,2-Dichlorobenzene	1.4	U		PPBV	F	JGJ-070-05
4VP023013A	GSP1-1	77.5		1,2-Dichloroethane	45			PPBV	F	JGJ-070-05
4VP023013A	GSP1-1	77.5		1,2-Dichloropropane	3.4			PPBV	F	JGJ-070-05
4VP023013A	GSP1-1	77.5		1,3,5-Trimethylbenzene	1.4	U		PPBV	F	JGJ-070-05
4VP023013A	GSP1-1	77.5		1,3-Dichlorobenzene	1.4	U		PPBV	F	JGJ-070-05
4VP023013A	GSP1-1	77.5		1,4-Dichlorobenzene	1.4	U		PPBV	F	JGJ-070-05
4VP023013A	GSP1-1	77.5		1-BUTENE, 2-METHYL-(1)	19	NJ		PPBV	T	
4VP023013A	GSP1-1	77.5		1-HEXANOL, 2-ETHYL-	4.1	NJ	NJ	PPBV	T	
4VP023013A	GSP1-1	77.5		1-PENTENE	5.5	NJ	NJ	PPBV	T	
4VP023013A	GSP1-1	77.5		1-PENTENE, 2-METHYL-	7	NJ	NJ	PPBV	T	
4VP023013A	GSP1-1	77.5		1-PENTENE, 3-METHYL-	7.8	NJ	NJ	PPBV	T	
4VP023013A	GSP1-1	77.5		1-PROPENE, 2-METHYL-	25	NJ	NJ	PPBV	T	
4VP023013A	GSP1-1	77.5		2-Butanone	1.4	U		PPBV	F	JGJ-070-05
4VP023013A	GSP1-1	77.5		2-BUTENE, 2-METHYL-	6.8	NJ	NJ	PPBV	T	

Table A-3. (continued).

Field Sample	Number	Location	Depth	Compound	Sample Result	Result Qualifier	Validation Flag	Sample Units	Organic TIC	L&V Report Number
4VP023013A	GSP1-1	77.5	2-BUTENE,(E)-	4	NJ	NJ	PPBV	T	JGJ-070-05	
4VP023013A	GSP1-1	77.5	2-Hexanone	1.2	U		PPBV	F	JGJ-070-05	
4VP023013A	GSP1-1	77.5	2-PENTENE	6.9	NJ	NJ	PPBV	T	JGJ-070-05	
4VP023013A	GSP1-1	77.5	4-Ethyltoluene	1.4	U		PPBV	F	JGJ-070-05	
4VP023013A	GSP1-1	77.5	4-Methyl-2-pentanone	1.4	U		PPBV	F	JGJ-070-05	
4VP023013A	GSP1-1	77.5	Acetone	4.6		U	PPBV	F	JGJ-070-05	
4VP023013A	GSP1-1	77.5	Benzene	1.4	U		PPBV	F	JGJ-070-05	
4VP023013A	GSP1-1	77.5	Benzyl chloride	1.4	U		PPBV	F	JGJ-070-05	
4VP023013A	GSP1-1	77.5	Bromomethane	1.2	U		PPBV	F	JGJ-070-05	
4VP023013A	GSP1-1	77.5	BUTANE	20	NJ	NJ	PPBV	T	JGJ-070-05	
4VP023013A	GSP1-1	77.5	BUTANE, 2-METHYL-	12	NJ	NJ	PPBV	T	JGJ-070-05	
4VP023013A	GSP1-1	77.5	Carbon disulfide	1.4	U		PPBV	F	JGJ-070-05	
4VP023013A	GSP1-1	77.5	Carbon tetrachloride	6.9			PPBV	F	JGJ-070-05	
4VP023013A	GSP1-1	77.5	Chlorobenzene	1.4	U		PPBV	F	JGJ-070-05	
4VP023013A	GSP1-1	77.5	Chloroethane	2.8			PPBV	F	JGJ-070-05	
4VP023013A	GSP1-1	77.5	Chloroform	23			PPBV	F	JGJ-070-05	
4VP023013A	GSP1-1	77.5	Chloromethane	1.4	U		PPBV	F	JGJ-070-05	
4VP023013A	GSP1-1	77.5	cis-1,2-Dichloroethene	7.1			PPBV	F	JGJ-070-05	
4VP023013A	GSP1-1	77.5	cis-1,3-Dichloropropene	1.4	U		PPBV	F	JGJ-070-05	
4VP023013A	GSP1-1	77.5	Dichlorodifluoromethane	1700	D		PPBV	F	JGJ-070-05	
4VP023013A	GSP1-1	77.5	Dichlorotetrafluoroethane	5.6			PPBV	F	JGJ-070-05	
4VP023013A	GSP1-1	77.5	ETHANE, 1,2-DICHLORO-1,1,2-TRIFLUORO-	24	NJ	NJ	PPBV	T		
4VP023013A	GSP1-1	77.5	ETHANE, 1-CHLORO-1,1,2-DIFLUORO-	30	NJ	NJ	PPBV	T		
4VP023013A	GSP1-1	77.5	ETHENE, CHLOROTRIFLUORO-	56	NJ	NJ	PPBV	T		
4VP023013A	GSP1-1	77.5	Ethylbenzene	1.4	U		PPBV	F	JGJ-070-05	
4VP023013A	GSP1-1	77.5	Hexachlorobutadiene	1.4	U		PPBV	F	JGJ-070-05	
4VP023013A	GSP1-1	77.5	ISOBUTANE	69	NJ	NJ	PPBV	T		
4VP023013A	GSP1-1	77.5	m,p-Xylenes	2.7	U		PPBV	F	JGJ-070-05	
4VP023013A	GSP1-1	77.5	Methane	5.15			PPMV	F	DMG-195-05	
4VP023013A	GSP1-1	77.5	METHANE, CHLORODIFLUORO-	18	NJ	NJ	PPBV	T		
4VP023013A	GSP1-1	77.5	METHANE, DICHLOROFUORO-	91	NJ	NJ	PPBV	T		
4VP023013A	GSP1-1	77.5	Methylene Chloride	5.6			PPBV	F	JGJ-070-05	
4VP023013A	GSP1-1	77.5	o-Xylene	1.4	U		PPBV	F	JGJ-070-05	
4VP023013A	GSP1-1	77.5	PENTANE	38	NJ	NJ	PPBV	T		
4VP023013A	GSP1-1	77.5	PENTANE, 3-METHYL-	17	NJ	NJ	PPBV	T		
4VP023013A	GSP1-1	77.5	Styrene	1.4	U		PPBV	F	JGJ-070-05	
4VP023013A	GSP1-1	77.5	Tetrachloroethene	57			PPBV	F	JGJ-070-05	
4VP023013A	GSP1-1	77.5	Toluene	1.4	U		PPBV	F	JGJ-070-05	
4VP023013A	GSP1-1	77.5	trans-1,2-Dichloroethene	1.4	U		PPBV	F	JGJ-070-05	
4VP023013A	GSP1-1	77.5	trans-1,3-Dichloropropene	1.4	U		PPBV	F	JGJ-070-05	
4VP023013A	GSP1-1	77.5	Trichloroethene	3100	D		PPBV	F	JGJ-070-05	
4VP023013A	GSP1-1	77.5	Trichlorofluoromethane	2600	D		PPBV	F	JGJ-070-05	
4VP023013A	GSP1-1	77.5	Vinyl Chloride	1.4	U		PPBV	F	JGJ-070-05	
4VP024013A	GSP1-1	107.5	1,1,1-Trichloroethane	24			PPBV	F	JGJ-070-05	
4VP024013A	GSP1-1	107.5	1,1,2,2-Tetrachloroethane	1.2	U		PPBV	F	JGJ-070-05	
4VP024013A	GSP1-1	107.5	1,1,2-Trichloroethane	1.2	U		PPBV	F	JGJ-070-05	
4VP024013A	GSP1-1	107.5	1,1,2-Trichlorotrifluoroethane	1.2	U		PPBV	F	JGJ-070-05	
4VP024013A	GSP1-1	107.5	1,1-Dichloroethane	1.4			PPBV	F	JGJ-070-05	
4VP024013A	GSP1-1	107.5	1,1-Dichloroethene	8.3			PPBV	F	JGJ-070-05	
4VP024013A	GSP1-1	107.5	1,2,4-Trichlorobenzene	1.3	U		PPBV	F	JGJ-070-05	
4VP024013A	GSP1-1	107.5	1,2,4-Trimethylbenzene	1.2	U		PPBV	F	JGJ-070-05	
4VP024013A	GSP1-1	107.5	1,2-Dibromoethane	1.2	U		PPBV	F	JGJ-070-05	
4VP024013A	GSP1-1	107.5	1,2-Dichlorobenzene	1.2	U		PPBV	F	JGJ-070-05	
4VP024013A	GSP1-1	107.5	1,2-Dichloroethane	1.2	U		PPBV	F	JGJ-070-05	
4VP024013A	GSP1-1	107.5	1,2-Dichloropropane	1.2	U		PPBV	F	JGJ-070-05	
4VP024013A	GSP1-1	107.5	1,3,5-Trimethylbenzene	1.2	U		PPBV	F	JGJ-070-05	
4VP024013A	GSP1-1	107.5	1,3-Dichlorobenzene	1.2	U		PPBV	F	JGJ-070-05	
4VP024013A	GSP1-1	107.5	1,4-Dichlorobenzene	1.2	U		PPBV	F	JGJ-070-05	
4VP024013A	GSP1-1	107.5	2-Butanone	1.2	U		PPBV	F	JGJ-070-05	
4VP024013A	GSP1-1	107.5	2-Hexanone	1	U		PPBV	F	JGJ-070-05	
4VP024013A	GSP1-1	107.5	4-Ethyltoluene	1.2	U		PPBV	F	JGJ-070-05	
4VP024013A	GSP1-1	107.5	4-Methyl-2-pentanone	1.2	U		PPBV	F	JGJ-070-05	
4VP024013A	GSP1-1	107.5	Acetone	3.4			PPBV	F	JGJ-070-05	
4VP024013A	GSP1-1	107.5	Benzene	1.2	U		PPBV	F	JGJ-070-05	
4VP024013A	GSP1-1	107.5	Benzyl chloride	1.2	U		PPBV	F	JGJ-070-05	
4VP024013A	GSP1-1	107.5	Bromomethane	1.1	U		PPBV	F	JGJ-070-05	
4VP024013A	GSP1-1	107.5	Carbon disulfide	1.2	U		PPBV	F	JGJ-070-05	
4VP024013A	GSP1-1	107.5	Carbon tetrachloride	1.2	U		PPBV	F	JGJ-070-05	
4VP024013A	GSP1-1	107.5	Chlorobenzene	1.2	U		PPBV	F	JGJ-070-05	
4VP024013A	GSP1-1	107.5	Chloroethane	1.1	U		PPBV	F	JGJ-070-05	
4VP024013A	GSP1-1	107.5	Chloroform	1.2	U		PPBV	F	JGJ-070-05	
4VP024013A	GSP1-1	107.5	Chloromethane	1.2	U		PPBV	F	JGJ-070-05	
4VP024013A	GSP1-1	107.5	cis-1,2-Dichloroethene	1.2	U		PPBV	F	JGJ-070-05	
4VP024013A	GSP1-1	107.5	cis-1,3-Dichloropropene	1.2	U		PPBV	F	JGJ-070-05	
4VP024013A	GSP1-1	107.5	CYCLOTETRASILOXANE, OCTAMETHYL-	7	NJ	R	PPBV	T		
4VP024013A	GSP1-1	107.5	CYCLOTRISILOXANE, HEXAMETHYL-	2.3	NJ	R	PPBV	T		
4VP024013A	GSP1-1	107.5	Dichlorodifluoromethane	1.3	U		PPBV	F	JGJ-070-05	

Table A-3. (continued).

Field Sample Number	Location	Depth	Compound	Sample Result	Result Qualifier	Validation Flag	Sample Units	Organic TIC	L&V Report Number
4VP024013A	GSP1-1	107.5	Dichlorotetrafluoroethane	1.2	U		PPBV	F	JGJ-070-05
4VP024013A	GSP1-1	107.5	Ethylbenzene	1.2	U		PPBV	F	JGJ-070-05
4VP024013A	GSP1-1	107.5	Hexachlorobutadiene	1.2	U		PPBV	F	JGJ-070-05
4VP024013A	GSP1-1	107.5	ISOPROPYL ALCOHOL	3.3	NJ		PPBV	T	
4VP024013A	GSP1-1	107.5	m,p-Xylenes	2.4	U		PPBV	F	JGJ-070-05
4VP024013A	GSP1-1	107.5	Methane	2		U	PPMV	F	DMG-195-05
4VP024013A	GSP1-1	107.5	Methylene Chloride	1.2	U		PPBV	F	JGJ-070-05
4VP024013A	GSP1-1	107.5	o-Xylene	1.2	U		PPBV	F	JGJ-070-05
4VP024013A	GSP1-1	107.5	Styrene	1.2	U		PPBV	F	JGJ-070-05
4VP024013A	GSP1-1	107.5	Tetrachloroethene	3.5			PPBV	F	JGJ-070-05
4VP024013A	GSP1-1	107.5	Toluene	1.2	U		PPBV	F	JGJ-070-05
4VP024013A	GSP1-1	107.5	trans-1,2-Dichloroethene	1.2	U		PPBV	F	JGJ-070-05
4VP024013A	GSP1-1	107.5	trans-1,3-Dichloropropene	1.2	U		PPBV	F	JGJ-070-05
4VP024013A	GSP1-1	107.5	Trichloroethene	4.6			PPBV	F	JGJ-070-05
4VP024013A	GSP1-1	107.5	Trichlorofluoromethane	1.2			PPBV	F	JGJ-070-05
4VP024013A	GSP1-1	107.5	Vinyl Chloride	1.2	U		PPBV	F	JGJ-070-05
4VP025013A	GSP2-1	12.5	1,1,1-Trichloroethane	15			PPBV	F	JGJ-070-05
4VP025013A	GSP2-1	12.5	1,1,2,2-Tetrachloroethane	1.2	U		PPBV	F	JGJ-070-05
4VP025013A	GSP2-1	12.5	1,1,2-Trichloroethane	1.2	U		PPBV	F	JGJ-070-05
4VP025013A	GSP2-1	12.5	1,1,2-Trichlorotrifluoroethane	3			PPBV	F	JGJ-070-05
4VP025013A	GSP2-1	12.5	1,1-Dichloroethane	7.6			PPBV	F	JGJ-070-05
4VP025013A	GSP2-1	12.5	1,1-Dichloroethene	1.3	U		PPBV	F	JGJ-070-05
4VP025013A	GSP2-1	12.5	1,2,4-Trichlorobenzene	1.3	U		PPBV	F	JGJ-070-05
4VP025013A	GSP2-1	12.5	1,2,4-Trimethylbenzene	1.2	U		PPBV	F	JGJ-070-05
4VP025013A	GSP2-1	12.5	1,2-Dibromoethane	1.2	U		PPBV	F	JGJ-070-05
4VP025013A	GSP2-1	12.5	1,2-Dichlorobenzene	1.2			PPBV	F	JGJ-070-05
4VP025013A	GSP2-1	12.5	1,2-Dichloroethane	1.2	U		PPBV	F	JGJ-070-05
4VP025013A	GSP2-1	12.5	1,2-Dichloropropane	1.2	U		PPBV	F	JGJ-070-05
4VP025013A	GSP2-1	12.5	1,3,5-Trimethylbenzene	1.2	U		PPBV	F	JGJ-070-05
4VP025013A	GSP2-1	12.5	1,3-Dichlorobenzene	1.2	U		PPBV	F	JGJ-070-05
4VP025013A	GSP2-1	12.5	1,4-Dichlorobenzene	1.2	U		PPBV	F	JGJ-070-05
4VP025013A	GSP2-1	12.5	1-HEXANOL, 2-ETHYL-	2.4	NJ	NJ	PPBV	T	
4VP025013A	GSP2-1	12.5	2-Butanone	1.4			PPBV	F	JGJ-070-05
4VP025013A	GSP2-1	12.5	2-Hexanone	1.1	U		PPBV	F	JGJ-070-05
4VP025013A	GSP2-1	12.5	4-Ethyltoluene	1.2	U		PPBV	F	JGJ-070-05
4VP025013A	GSP2-1	12.5	4-Methyl-2-pentanone	1.2	U		PPBV	F	JGJ-070-05
4VP025013A	GSP2-1	12.5	ACETIC ACID	1.4	NJ	NJ	PPBV	T	
4VP025013A	GSP2-1	12.5	Acetone	6		U	PPBV	F	JGJ-070-05
4VP025013A	GSP2-1	12.5	Benzene	1.2	U		PPBV	F	JGJ-070-05
4VP025013A	GSP2-1	12.5	Benzyl chloride	1.2	U		PPBV	F	JGJ-070-05
4VP025013A	GSP2-1	12.5	Bromomethane	1.1	U		PPBV	F	JGJ-070-05
4VP025013A	GSP2-1	12.5	BUTANAMIDE, 2,2,3,3,4,4-HEPTAFLUORO-N	1.3	NJ	NJ	PPBV	T	
4VP025013A	GSP2-1	12.5	BUTANE, 2-METHYL-	14	NJ	NJ	PPBV	T	
4VP025013A	GSP2-1	12.5	Carbon disulfide	1.2	U		PPBV	F	JGJ-070-05
4VP025013A	GSP2-1	12.5	Carbon tetrachloride	1.2	U		PPBV	F	JGJ-070-05
4VP025013A	GSP2-1	12.5	Chlorobenzene	1.2	U		PPBV	F	JGJ-070-05
4VP025013A	GSP2-1	12.5	Chloroethane	1.2	U		PPBV	F	JGJ-070-05
4VP025013A	GSP2-1	12.5	Chloroform	1.2	U		PPBV	F	JGJ-070-05
4VP025013A	GSP2-1	12.5	Chloromethane	1.2	U		PPBV	F	JGJ-070-05
4VP025013A	GSP2-1	12.5	cis-1,2-Dichloroethene	6.1			PPBV	F	JGJ-070-05
4VP025013A	GSP2-1	12.5	cis-1,3-Dichloropropene	1.2	U		PPBV	F	JGJ-070-05
4VP025013A	GSP2-1	12.5	CYCLOTETRASILOXANE, OCTAMETHYL-	1.7	NJ	R	PPBV	T	
4VP025013A	GSP2-1	12.5	CYCLOTRISILOXANE, HEXAMETHYL-	3.2	NJ	R	PPBV	T	
4VP025013A	GSP2-1	12.5	Dichlorodifluoromethane	19			PPBV	F	JGJ-070-05
4VP025013A	GSP2-1	12.5	Dichlorotetrafluoroethane	1.3	U		PPBV	F	JGJ-070-05
4VP025013A	GSP2-1	12.5	D-LIMONENE	1.4	NJ	NJ	PPBV	T	
4VP025013A	GSP2-1	12.5	Ethylbenzene	1.2	U		PPBV	F	JGJ-070-05
4VP025013A	GSP2-1	12.5	Hexachlorobutadiene	1.2	U		PPBV	F	JGJ-070-05
4VP025013A	GSP2-1	12.5	HEXANAL	1.3	NJ	NJ	PPBV	T	
4VP025013A	GSP2-1	12.5	ISOBUTANE	10	NJ	NJ	PPBV	T	
4VP025013A	GSP2-1	12.5	ISOPROPYL ALCOHOL	2.8	NJ	NJ	PPBV	T	
4VP025013A	GSP2-1	12.5	m,p-Xylenes	2.5	U		PPBV	F	JGJ-070-05
4VP025013A	GSP2-1	12.5	Methane	1.88		U	PPMV	F	DMG-195-05
4VP025013A	GSP2-1	12.5	Methylene Chloride	1.2	U		PPBV	F	JGJ-070-05
4VP025013A	GSP2-1	12.5	o-Xylene	1.2	U		PPBV	F	JGJ-070-05
4VP025013A	GSP2-1	12.5	PENTANE	2.2	NJ	NJ	PPBV	T	
4VP025013A	GSP2-1	12.5	Styrene	1.2	U		PPBV	F	JGJ-070-05
4VP025013A	GSP2-1	12.5	Tetrachloroethene	28			PPBV	F	JGJ-070-05
4VP025013A	GSP2-1	12.5	Toluene	3.6		U	PPBV	F	JGJ-070-05
4VP025013A	GSP2-1	12.5	trans-1,2-Dichloroethene	1.3	U		PPBV	F	JGJ-070-05
4VP025013A	GSP2-1	12.5	trans-1,3-Dichloropropene	1.2	U		PPBV	F	JGJ-070-05
4VP025013A	GSP2-1	12.5	Trichloroethene	17			PPBV	F	JGJ-070-05
4VP025013A	GSP2-1	12.5	Trichlorofluoromethane	8.5			PPBV	F	JGJ-070-05
4VP025013A	GSP2-1	12.5	Vinyl Chloride	1.2	U		PPBV	F	JGJ-070-05
4VP026013A	GSP2-1	37.5	1,1,1-Trichloroethane	12			PPBV	F	JGJ-070-05
4VP026013A	GSP2-1	37.5	1,1,2,2-Tetrachloroethane	1.1	U		PPBV	F	JGJ-070-05
4VP026013A	GSP2-1	37.5	1,1,2-Trichloroethane	1.1	U		PPBV	F	JGJ-070-05

Table A-3. (continued).

Field Sample	Number	Location	Depth	Compound	Sample Result	Result Qualifier	Validation Flag	Sample Units	Organic TIC	L&V Report Number
4VP026013A	GSP2-1	37.5		1,1,2-Trichlorotrifluoroethane	12			PPBV	F	JGJ-070-05
4VP026013A	GSP2-1	37.5		1,1-Dichloroethane	2.5			PPBV	F	JGJ-070-05
4VP026013A	GSP2-1	37.5		1,1-Dichloroethene	1.2	U		PPBV	F	JGJ-070-05
4VP026013A	GSP2-1	37.5		1,2,4-Trichlorobenzene	1.2	U		PPBV	F	JGJ-070-05
4VP026013A	GSP2-1	37.5		1,2,4-Trimethylbenzene	1.7			PPBV	F	JGJ-070-05
4VP026013A	GSP2-1	37.5		1,2-Dibromoethane	1.1	U		PPBV	F	JGJ-070-05
4VP026013A	GSP2-1	37.5		1,2-Dichlorobenzene	1.1	U		PPBV	F	JGJ-070-05
4VP026013A	GSP2-1	37.5		1,2-Dichloroethane	1.1	U		PPBV	F	JGJ-070-05
4VP026013A	GSP2-1	37.5		1,2-Dichloropropane	1.1	U		PPBV	F	JGJ-070-05
4VP026013A	GSP2-1	37.5		1,3,5-Trimethylbenzene	1.1	U		PPBV	F	JGJ-070-05
4VP026013A	GSP2-1	37.5		1,3-Dichlorobenzene	1.1	U		PPBV	F	JGJ-070-05
4VP026013A	GSP2-1	37.5		1,4-Dichlorobenzene	1.1	U		PPBV	F	JGJ-070-05
4VP026013A	GSP2-1	37.5		1-PENTENE	32	NJ	NJ	PPBV	T	
4VP026013A	GSP2-1	37.5		2-Butanone	5			PPBV	F	JGJ-070-05
4VP026013A	GSP2-1	37.5		2-BUTENAL, (E),	5.3	J	J	PPBV	T	
4VP026013A	GSP2-1	37.5		2-BUTENAL, 2-METHYL,-(E)	20	J	J	PPBV	T	
4VP026013A	GSP2-1	37.5		2-BUTENAL, 3-METHYL-	24	NJ	NJ	PPBV	T	
4VP026013A	GSP2-1	37.5		2-Hexanone	0.98	U		PPBV	F	JGJ-070-05
4VP026013A	GSP2-1	37.5		2-PROPENAL, 2-METHYL-	18	NJ	NJ	PPBV	T	
4VP026013A	GSP2-1	37.5		3-BUTEN-2-ONE,3-METHYL-	3	NJ	NJ	PPBV	T	
4VP026013A	GSP2-1	37.5		3-CARENE	4.3	NJ	NJ	PPBV	T	
4VP026013A	GSP2-1	37.5		3-PENTEN-2-ONE, 4-METHYL-	9.7	NJ	NJ	PPBV	T	
4VP026013A	GSP2-1	37.5		4-Ethyltoluene	1.1	U		PPBV	F	JGJ-070-05
4VP026013A	GSP2-1	37.5		4-Methyl-2-pantanone	1.1	U		PPBV	F	JGJ-070-05
4VP026013A	GSP2-1	37.5		ACETIC ACID, METHYL ESTER	4	NJ	NJ	PPBV	T	
4VP026013A	GSP2-1	37.5		Acetone	73			PPBV	F	JGJ-070-05
4VP026013A	GSP2-1	37.5		Benzene	1.8			PPBV	F	JGJ-070-05
4VP026013A	GSP2-1	37.5		Benzyl chloride	1.1	U		PPBV	F	JGJ-070-05
4VP026013A	GSP2-1	37.5		Bromomethane	1	U		PPBV	F	JGJ-070-05
4VP026013A	GSP2-1	37.5		BUTANAL, 3-METHYL-	3.4	NJ	NJ	PPBV	T	
4VP026013A	GSP2-1	37.5		BUTANE, 2-METHYL-	76	NJ	NJ	PPBV	T	
4VP026013A	GSP2-1	37.5		Carbon disulfide	1.8			PPBV	F	JGJ-070-05
4VP026013A	GSP2-1	37.5		Carbon tetrachloride	2.7			PPBV	F	JGJ-070-05
4VP026013A	GSP2-1	37.5		Chlorobenzene	1.1	U		PPBV	F	JGJ-070-05
4VP026013A	GSP2-1	37.5		Chloroethane	1.1	U		PPBV	F	JGJ-070-05
4VP026013A	GSP2-1	37.5		Chloroform	1.1	U		PPBV	F	JGJ-070-05
4VP026013A	GSP2-1	37.5		Chloromethane	1.1	U		PPBV	F	JGJ-070-05
4VP026013A	GSP2-1	37.5		cis-1,2-Dichloroethene	2.5			PPBV	F	JGJ-070-05
4VP026013A	GSP2-1	37.5		cis-1,3-Dichloropropene	1.1	U		PPBV	F	JGJ-070-05
4VP026013A	GSP2-1	37.5		CYCLOHEXANE	7.6	NJ	NJ	PPBV	T	
4VP026013A	GSP2-1	37.5		DECANE	3.2	NJ	NJ	PPBV	T	
4VP026013A	GSP2-1	37.5		Dichlorodifluoromethane	75			PPBV	F	JGJ-070-05
4VP026013A	GSP2-1	37.5		Dichlorotetrafluoroethane	1.2	U		PPBV	F	JGJ-070-05
4VP026013A	GSP2-1	37.5		Ethylbenzene	3.9			PPBV	F	JGJ-070-05
4VP026013A	GSP2-1	37.5		Hexachlorobutadiene	1.1	U		PPBV	F	JGJ-070-05
4VP026013A	GSP2-1	37.5		ISOBUTANE	28	NJ	NJ	PPBV	T	
4VP026013A	GSP2-1	37.5		ISOPROPYL ALCOHOL	11	NJ	NJ	PPBV	T	
4VP026013A	GSP2-1	37.5		m,p-Xylenes	14			PPBV	F	JGJ-070-05
4VP026013A	GSP2-1	37.5		Methane	2.99		U	PPMV	F	DMG-195-05
4VP026013A	GSP2-1	37.5		Methylene Chloride	5.8			PPBV	F	JGJ-070-05
4VP026013A	GSP2-1	37.5		o-Xylene	3.1			PPBV	F	JGJ-070-05
4VP026013A	GSP2-1	37.5		PENTANE	87	NJ	NJ	PPBV	T	
4VP026013A	GSP2-1	37.5		PENTANE, 3-METHYL-	2.8	NJ	NJ	PPBV	T	
4VP026013A	GSP2-1	37.5		PROPANOL, 2-METHYL-	33	NJ	NJ	PPBV	T	
4VP026013A	GSP2-1	37.5		Styrene	1.3			PPBV	F	JGJ-070-05
4VP026013A	GSP2-1	37.5		SULFUR DIOXIDE	51	NJ	NJ	PPBV	T	
4VP026013A	GSP2-1	37.5		Tetrachloroethene	28			PPBV	F	JGJ-070-05
4VP026013A	GSP2-1	37.5		Toluene	24			PPBV	F	JGJ-070-05
4VP026013A	GSP2-1	37.5		trans-1,2-Dichloroethene	1.2	U		PPBV	F	JGJ-070-05
4VP026013A	GSP2-1	37.5		trans-1,3-Dichloropropene	1.1	U		PPBV	F	JGJ-070-05
4VP026013A	GSP2-1	37.5		Trichloroethene	17			PPBV	F	JGJ-070-05
4VP026013A	GSP2-1	37.5		Trichlorofluoromethane	23			PPBV	F	JGJ-070-05
4VP026013A	GSP2-1	37.5		Vinyl Chloride	1.1	U		PPBV	F	JGJ-070-05
4VP027013A	GSP2-1	77.5		1,1,1-Trichloroethane	45			PPBV	F	JGJ-070-05
4VP027013A	GSP2-1	77.5		1,1,2,2-Tetrachloroethane	1.2	U		PPBV	F	JGJ-070-05
4VP027013A	GSP2-1	77.5		1,1,2-Trichloroethane	1.2	U		PPBV	F	JGJ-070-05
4VP027013A	GSP2-1	77.5		1,1,2-Trichlorotrifluoroethane	36			PPBV	F	JGJ-070-05
4VP027013A	GSP2-1	77.5		1,1-Dichloroethane	22			PPBV	F	JGJ-070-05
4VP027013A	GSP2-1	77.5		1,1-Dichloroethene	1.3	U		PPBV	F	JGJ-070-05
4VP027013A	GSP2-1	77.5		1,2,4-Trichlorobenzene	1.3	U		PPBV	F	JGJ-070-05
4VP027013A	GSP2-1	77.5		1,2,4-Trimethylbenzene	1.4			PPBV	F	JGJ-070-05
4VP027013A	GSP2-1	77.5		1,2-Dibromoethane	1.2	U		PPBV	F	JGJ-070-05
4VP027013A	GSP2-1	77.5		1,2-Dichlorobenzene	1.2	U		PPBV	F	JGJ-070-05
4VP027013A	GSP2-1	77.5		1,2-Dichloroethane	1.2	U		PPBV	F	JGJ-070-05
4VP027013A	GSP2-1	77.5		1,2-Dichloropropane	1.2	U		PPBV	F	JGJ-070-05
4VP027013A	GSP2-1	77.5		1,3,5-Trimethylbenzene	1.2	U		PPBV	F	JGJ-070-05
4VP027013A	GSP2-1	77.5		1,3-Dichlorobenzene	1.2	U		PPBV	F	JGJ-070-05

Table A-3. (continued).

Field Sample	Number	Location	Depth	Compound	Sample Result	Result Qualifier	Validation Flag	Sample Units	Organic TIC	L&V Report Number
4VP027013A	GSP2-1	77.5		1,4-Dichlorobenzene	1.2	U		PPBV	F	JGJ-070-05
4VP027013A	GSP2-1	77.5		1-PENTENE, 2,4,4-TRIMETHYL-	2.2	NJ	NJ	PPBV	T	
4VP027013A	GSP2-1	77.5		2-Butanone	3.8			PPBV	F	JGJ-070-05
4VP027013A	GSP2-1	77.5		2-Hexanone	1	U		PPBV	F	JGJ-070-05
4VP027013A	GSP2-1	77.5		4-Ethyltoluene	1.2	U		PPBV	F	JGJ-070-05
4VP027013A	GSP2-1	77.5		4-Methyl-2-pentanone	1.2	U		PPBV	F	JGJ-070-05
4VP027013A	GSP2-1	77.5		Acetone	18		U	PPBV	F	JGJ-070-05
4VP027013A	GSP2-1	77.5		Benzene	1.2	U		PPBV	F	JGJ-070-05
4VP027013A	GSP2-1	77.5		BENZENE, 2-PHENYL-4-(2-CYANO-2-PHE	4.7	NJ	NJ	PPBV	T	
4VP027013A	GSP2-1	77.5		Benzyl chloride	1.2	U		PPBV	F	JGJ-070-05
4VP027013A	GSP2-1	77.5		Bromomethane	1.1	U		PPBV	F	JGJ-070-05
4VP027013A	GSP2-1	77.5		BUTANE, 2-METHYL-	45	NJ	NJ	PPBV	T	
4VP027013A	GSP2-1	77.5		Carbon disulfide	1.2	U		PPBV	F	JGJ-070-05
4VP027013A	GSP2-1	77.5		Carbon tetrachloride	12			PPBV	F	JGJ-070-05
4VP027013A	GSP2-1	77.5		Chlorobenzene	1.2	U		PPBV	F	JGJ-070-05
4VP027013A	GSP2-1	77.5		Chloroethane	1.1	U		PPBV	F	JGJ-070-05
4VP027013A	GSP2-1	77.5		Chloroform	6.9			PPBV	F	JGJ-070-05
4VP027013A	GSP2-1	77.5		Chloromethane	1.2	U		PPBV	F	JGJ-070-05
4VP027013A	GSP2-1	77.5		cis-1,2-Dichloroethene	2.9			PPBV	F	JGJ-070-05
4VP027013A	GSP2-1	77.5		cis-1,3-Dichloropropene	1.2	U		PPBV	F	JGJ-070-05
4VP027013A	GSP2-1	77.5		CYCLOBUTANE, METHYL-	3.1	NJ	NJ	PPBV	T	
4VP027013A	GSP2-1	77.5		CYCLOTRISILOXANE, HEXAMETHYL-	14	NJ	R	PPBV	T	
4VP027013A	GSP2-1	77.5		DECANE	2.3	NJ	NJ	PPBV	T	
4VP027013A	GSP2-1	77.5		DECANE, 2,2,7-TRIMETHYL-	3.1	J	J	PPBV	T	
4VP027013A	GSP2-1	77.5		Dichlorodifluoromethane	180	D		PPBV	F	JGJ-070-05
4VP027013A	GSP2-1	77.5		Dichlorotetrafluoroethane	2.8			PPBV	F	JGJ-070-05
4VP027013A	GSP2-1	77.5		D-LIMONENE	3	J	J	PPBV	T	
4VP027013A	GSP2-1	77.5		ETHANE, 1,2-DICHLORO-1,1,2-TRIFLUORO-	4.5	NJ	NJ	PPBV	T	
4VP027013A	GSP2-1	77.5		ETHANE, 1-CHLORO-1,1-DIFLUORO-	2.9	NJ	NJ	PPBV	T	
4VP027013A	GSP2-1	77.5		ETHENE, CHLOROTRIFLUORO-	3.8	NJ	NJ	PPBV	T	
4VP027013A	GSP2-1	77.5		Ethylbenzene	2.6			PPBV	F	JGJ-070-05
4VP027013A	GSP2-1	77.5		Hexachlorobutadiene	1.2	U		PPBV	F	JGJ-070-05
4VP027013A	GSP2-1	77.5		HEXANAL	2.6	NJ	NJ	PPBV	T	
4VP027013A	GSP2-1	77.5		ISOBUTANE	38	NJ	NJ	PPBV	T	
4VP027013A	GSP2-1	77.5		m,p-Xylenes	8.8			PPBV	F	JGJ-070-05
4VP027013A	GSP2-1	77.5		Methane	2.25		U	PPMV	F	DMG-195-05
4VP027013A	GSP2-1	77.5		METHANE, CHLORODIFLUORO-	7.9	NJ	NJ	PPBV	T	
4VP027013A	GSP2-1	77.5		METHANE, DICHLOROFUORO-	7.6	NJ	NJ	PPBV	T	
4VP027013A	GSP2-1	77.5		Methylene Chloride	1.9			PPBV	F	JGJ-070-05
4VP027013A	GSP2-1	77.5		o-Xylene	2.5			PPBV	F	JGJ-070-05
4VP027013A	GSP2-1	77.5		PENTANE	8.4	NJ	NJ	PPBV	T	
4VP027013A	GSP2-1	77.5		Styrene	1.2	U		PPBV	F	JGJ-070-05
4VP027013A	GSP2-1	77.5		Tetrachloroethene	39			PPBV	F	JGJ-070-05
4VP027013A	GSP2-1	77.5		Toluene	16		U	PPBV	F	JGJ-070-05
4VP027013A	GSP2-1	77.5		trans-1,2-Dichloroethene	1.2	U		PPBV	F	JGJ-070-05
4VP027013A	GSP2-1	77.5		trans-1,3-Dichloropropene	1.2	U		PPBV	F	JGJ-070-05
4VP027013A	GSP2-1	77.5		Trichloroethene	17			PPBV	F	JGJ-070-05
4VP027013A	GSP2-1	77.5		Trichlorofluoromethane	66			PPBV	F	JGJ-070-05
4VP027013A	GSP2-1	77.5		UNKNOWN1	2.9	J	J	PPBV	T	
4VP027013A	GSP2-1	77.5		UNKNOWN2	2.7	J	J	PPBV	T	
4VP027013A	GSP2-1	77.5		UNKNOWN3	2.2	J	J	PPBV	T	
4VP027013A	GSP2-1	77.5		Vinyl Chloride	1.2	U		PPBV	F	JGJ-070-05
4VP028013A	GSP2-1	107.5		1,1,1-Trichloroethane	18			PPBV	F	JGJ-070-05
4VP028013A	GSP2-1	107.5		1,1,2,2-Tetrachloroethane	1.3	U		PPBV	F	JGJ-070-05
4VP028013A	GSP2-1	107.5		1,1,2-Trichloroethane	1.3	U		PPBV	F	JGJ-070-05
4VP028013A	GSP2-1	107.5		1,1,2-Trichlorofluorooethane	10			PPBV	F	JGJ-070-05
4VP028013A	GSP2-1	107.5		1,1-DICHLORO-1-FLUOROETHANE	2.3	NJ	NJ	PPBV	T	
4VP028013A	GSP2-1	107.5		1,1-Dichloroethane	12			PPBV	F	JGJ-070-05
4VP028013A	GSP2-1	107.5		1,1-Dichloroethene	1.5			PPBV	F	JGJ-070-05
4VP028013A	GSP2-1	107.5		1,2,4-Trichlorobenzene	1.4	U		PPBV	F	JGJ-070-05
4VP028013A	GSP2-1	107.5		1,2,4-Trimethylbenzene	1.3	U		PPBV	F	JGJ-070-05
4VP028013A	GSP2-1	107.5		1,2-Dibromoethane	1.3	U		PPBV	F	JGJ-070-05
4VP028013A	GSP2-1	107.5		1,2-Dichlorobenzene	1.3	U		PPBV	F	JGJ-070-05
4VP028013A	GSP2-1	107.5		1,2-Dichloroethane	1.3	U		PPBV	F	JGJ-070-05
4VP028013A	GSP2-1	107.5		1,2-Dichloropropane	1.3	U		PPBV	F	JGJ-070-05
4VP028013A	GSP2-1	107.5		1,3,5-Trimethylbenzene	1.3	U		PPBV	F	JGJ-070-05
4VP028013A	GSP2-1	107.5		1,3-Dichlorobenzene	1.3	U		PPBV	F	JGJ-070-05
4VP028013A	GSP2-1	107.5		1,4-Dichlorobenzene	1.3	U		PPBV	F	JGJ-070-05
4VP028013A	GSP2-1	107.5		2-Butanone	2.6			PPBV	F	JGJ-070-05
4VP028013A	GSP2-1	107.5		2-Hexanone	1.1	U		PPBV	F	JGJ-070-05
4VP028013A	GSP2-1	107.5		4-Ethyltoluene	1.3	U		PPBV	F	JGJ-070-05
4VP028013A	GSP2-1	107.5		4-Methyl-2-pentanone	1.3	U		PPBV	F	JGJ-070-05
4VP028013A	GSP2-1	107.5		Acetone	10			PPBV	F	JGJ-070-05
4VP028013A	GSP2-1	107.5		Benzene	1.3	U		PPBV	F	JGJ-070-05
4VP028013A	GSP2-1	107.5		Benzyl chloride	1.3	U		PPBV	F	JGJ-070-05
4VP028013A	GSP2-1	107.5		Bromomethane	1.2	U		PPBV	F	JGJ-070-05
4VP028013A	GSP2-1	107.5		BUTANAMIDE, 2,2,3,3,4,4,4-HEPTAFLUORO-N	1.7	NJ	NJ	PPBV	T	

Table A-3. (continued).

Field Sample Number	Location	Depth	Compound	Sample Result	Result Qualifier	Validation Flag	Sample Units	Organic TIC	L&V Report Number
4VP028013A	GSP2-1	107.5	BUTANE, 2-METHYL-	11	NJ	NJ	PPBV	T	JGJ-070-05
4VP028013A	GSP2-1	107.5	Carbon disulfide	1.3	U		PPBV	F	JGJ-070-05
4VP028013A	GSP2-1	107.5	Carbon tetrachloride	4			PPBV	F	JGJ-070-05
4VP028013A	GSP2-1	107.5	Chlorobenzene	1.3	U		PPBV	F	JGJ-070-05
4VP028013A	GSP2-1	107.5	Chloroethane	1.2	U		PPBV	F	JGJ-070-05
4VP028013A	GSP2-1	107.5	Chloroform	4.2			PPBV	F	JGJ-070-05
4VP028013A	GSP2-1	107.5	Chloromethane	1.3	U		PPBV	F	JGJ-070-05
4VP028013A	GSP2-1	107.5	cis-1,2-Dichloroethene	1.9			PPBV	F	JGJ-070-05
4VP028013A	GSP2-1	107.5	cis-1,3-Dichloropropene	1.3	U		PPBV	F	JGJ-070-05
4VP028013A	GSP2-1	107.5	CYCLOTETRASILOXANE, OCTAMETHYL-	1.6	NJ	R	PPBV	T	
4VP028013A	GSP2-1	107.5	CYCLOTRISILOXANE, HEXAMETHYL-	3.8	NJ	R	PPBV	T	
4VP028013A	GSP2-1	107.5	Dichlorodifluoromethane	65			PPBV	F	JGJ-070-05
4VP028013A	GSP2-1	107.5	Dichlorotetrafluoroethane	1.4	U		PPBV	F	JGJ-070-05
4VP028013A	GSP2-1	107.5	ETHANE, 1,2-DICHLORO-1,1,2-TRIFLUORO-	1.8	NJ	NJ	PPBV	T	
4VP028013A	GSP2-1	107.5	ETHENE, CHLOROTRIFLUORO-	2	NJ	NJ	PPBV	T	
4VP028013A	GSP2-1	107.5	Ethylbenzene	1.3	U		PPBV	F	JGJ-070-05
4VP028013A	GSP2-1	107.5	Hexachlorobutadiene	1.3	U		PPBV	F	JGJ-070-05
4VP028013A	GSP2-1	107.5	HEXANAL	1.8	NJ	NJ	PPBV	T	
4VP028013A	GSP2-1	107.5	ISOBUTANE	15	NJ	NJ	PPBV	T	
4VP028013A	GSP2-1	107.5	m,p-Xylenes	2.7	U		PPBV	F	JGJ-070-05
4VP028013A	GSP2-1	107.5	Methane	2.53		U	PPMV	F	DMG-195-05
4VP028013A	GSP2-1	107.5	METHANE, CHLORODIFLUORO-	3.2	NJ	NJ	PPBV	T	
4VP028013A	GSP2-1	107.5	METHANE, DICHLOROFUORO-	3.1	NJ	NJ	PPBV	T	
4VP028013A	GSP2-1	107.5	Methylene Chloride	1.3	U		PPBV	F	JGJ-070-05
4VP028013A	GSP2-1	107.5	NONANAL	2.9	NJ	NJ	PPBV	T	
4VP028013A	GSP2-1	107.5	OCTANAL	1.8	NJ	NJ	PPBV	T	
4VP028013A	GSP2-1	107.5	o-Xylene	1.3	U		PPBV	F	JGJ-070-05
4VP028013A	GSP2-1	107.5	PENTANE	2.6	NJ	NJ	PPBV	T	
4VP028013A	GSP2-1	107.5	Styrene	1.3	U		PPBV	F	JGJ-070-05
4VP028013A	GSP2-1	107.5	Tetrachloroethene	24			PPBV	F	JGJ-070-05
4VP028013A	GSP2-1	107.5	Toluene	2.9		U	PPBV	F	JGJ-070-05
4VP028013A	GSP2-1	107.5	trans-1,2-Dichloroethene	1.4	U		PPBV	F	JGJ-070-05
4VP028013A	GSP2-1	107.5	trans-1,3-Dichloropropene	1.3	U		PPBV	F	JGJ-070-05
4VP028013A	GSP2-1	107.5	Trichloroethene	8.9			PPBV	F	JGJ-070-05
4VP028013A	GSP2-1	107.5	Trichlorofluoromethane	22			PPBV	F	JGJ-070-05
4VP028013A	GSP2-1	107.5	Vinyl Chloride	1.3	U		PPBV	F	JGJ-070-05
4VP029013A	GSP2-2	12.5	1,1,1-Trichloroethane	1600	D		PPBV	F	JGJ-070-05
4VP029013A	GSP2-2	12.5	1,1,2-Tetrachloroethane	1.3	U		PPBV	F	JGJ-070-05
4VP029013A	GSP2-2	12.5	1,1,2-Trichloroethane	1.3	U		PPBV	F	JGJ-070-05
4VP029013A	GSP2-2	12.5	1,1,2-Trichlorotrifluoroethane	44			PPBV	F	JGJ-070-05
4VP029013A	GSP2-2	12.5	1,1-DICHLORO-1-FLUOROETHANE	1.4	NJ	NJ	PPBV	T	
4VP029013A	GSP2-2	12.5	1,1-Dichloroethane	3000	D		PPBV	F	JGJ-070-05
4VP029013A	GSP2-2	12.5	1,1-Dichloroethene	63			PPBV	F	JGJ-070-05
4VP029013A	GSP2-2	12.5	1,2,4-Trichlorobenzene	1.3	U		PPBV	F	JGJ-070-05
4VP029013A	GSP2-2	12.5	1,2,4-Trimethylbenzene	1.3	U		PPBV	F	JGJ-070-05
4VP029013A	GSP2-2	12.5	1,2-Dibromoethane	1.3	U		PPBV	F	JGJ-070-05
4VP029013A	GSP2-2	12.5	1,2-Dichlorobenzene	1.3	U		PPBV	F	JGJ-070-05
4VP029013A	GSP2-2	12.5	1,2-Dichloroethane	1.3	U		PPBV	F	JGJ-070-05
4VP029013A	GSP2-2	12.5	1,2-Dichloropropane	29			PPBV	F	JGJ-070-05
4VP029013A	GSP2-2	12.5	1,3,5-Trimethylbenzene	1.3	U		PPBV	F	JGJ-070-05
4VP029013A	GSP2-2	12.5	1,3-Dichlorobenzene	1.3	U		PPBV	F	JGJ-070-05
4VP029013A	GSP2-2	12.5	1,4-Dichlorobenzene	1.3	U		PPBV	F	JGJ-070-05
4VP029013A	GSP2-2	12.5	2-Butanone	1.3	U		PPBV	F	JGJ-070-05
4VP029013A	GSP2-2	12.5	2-Hexanone	1.1	U		PPBV	F	JGJ-070-05
4VP029013A	GSP2-2	12.5	4-Ethyltoluene	1.3	U		PPBV	F	JGJ-070-05
4VP029013A	GSP2-2	12.5	4-Methyl-2-pentanone	1.3	U		PPBV	F	JGJ-070-05
4VP029013A	GSP2-2	12.5	ACETIC ACID, CHLOROFUORO-, ETHYL	33	NJ	NJ	PPBV	T	
4VP029013A	GSP2-2	12.5	Acetone	4.1		U	PPBV	F	JGJ-070-05
4VP029013A	GSP2-2	12.5	Benzene	1.3	U		PPBV	F	JGJ-070-05
4VP029013A	GSP2-2	12.5	Benzyl chloride	1.3	U		PPBV	F	JGJ-070-05
4VP029013A	GSP2-2	12.5	Bromomethane	1.1	U		PPBV	F	JGJ-070-05
4VP029013A	GSP2-2	12.5	BUTANAL	2	NJ	NJ	PPBV	T	
4VP029013A	GSP2-2	12.5	Carbon disulfide	1.3	U		PPBV	F	JGJ-070-05
4VP029013A	GSP2-2	12.5	Carbon tetrachloride	1.3	U		PPBV	F	JGJ-070-05
4VP029013A	GSP2-2	12.5	Chlorobenzene	1.3	U		PPBV	F	JGJ-070-05
4VP029013A	GSP2-2	12.5	Chloroethane	8.2			PPBV	F	JGJ-070-05
4VP029013A	GSP2-2	12.5	Chloroform	18			PPBV	F	JGJ-070-05
4VP029013A	GSP2-2	12.5	Chloromethane	1.3	U		PPBV	F	JGJ-070-05
4VP029013A	GSP2-2	12.5	cis-1,2-Dichloroethene	3000	D		PPBV	F	JGJ-070-05
4VP029013A	GSP2-2	12.5	cis-1,3-Dichloropropene	1.3	U		PPBV	F	JGJ-070-05
4VP029013A	GSP2-2	12.5	CYCLOHEXANE	2.9	NJ	NJ	PPBV	T	
4VP029013A	GSP2-2	12.5	CYCLOTETRASILOXANE, OCTAMETHYL-	2.8	NJ	R	PPBV	T	
4VP029013A	GSP2-2	12.5	CYCLOTRISILOXANE, HEXAMETHYL-	2.3	NJ	R	PPBV	T	
4VP029013A	GSP2-2	12.5	Dichlorodifluoromethane	1000	D		PPBV	F	JGJ-070-05
4VP029013A	GSP2-2	12.5	Dichlortetrafluoroethane	1.9			PPBV	F	JGJ-070-05
4VP029013A	GSP2-2	12.5	ETHANE, 1,2-DICHLORO-1,1,2-TRIFLUORO-	12	NJ	NJ	PPBV	T	
4VP029013A	GSP2-2	12.5	ETHENE, CHLOROTRIFLUORO-	38	NJ	NJ	PPBV	T	

Table A-3. (continued).

Field Sample Number	Location	Depth	Compound	Sample Result	Result Qualifier	Validation Flag	Sample Units	Organic TIC	L&V Report Number
4VP029013A	GSP2-2	12.5	ETHYL ETHER	5.1	NJ	NJ	PPBV	T	JGJ-070-05
4VP029013A	GSP2-2	12.5	Ethylbenzene	1.3	U		PPBV	F	JGJ-070-05
4VP029013A	GSP2-2	12.5	FURAN, TETRAHYDRO-	6	NJ	NJ	PPBV	T	JGJ-070-05
4VP029013A	GSP2-2	12.5	Hexachlorobutadiene	1.3	U		PPBV	F	JGJ-070-05
4VP029013A	GSP2-2	12.5	ISOBUTANE	60	NJ	NJ	PPBV	T	JGJ-070-05
4VP029013A	GSP2-2	12.5	m,p-Xylenes	2.5	U		PPBV	F	JGJ-070-05
4VP029013A	GSP2-2	12.5	Methane	2.63		U	PPMV	F	DMG-195-05
4VP029013A	GSP2-2	12.5	METHANE, CHLORODIFLUORO-	29	NJ	NJ	PPBV	T	JGJ-070-05
4VP029013A	GSP2-2	12.5	METHANE, DICHLOROFUORO-	22	NJ	NJ	PPBV	T	JGJ-070-05
4VP029013A	GSP2-2	12.5	Methylene Chloride	2.9			PPBV	F	JGJ-070-05
4VP029013A	GSP2-2	12.5	o-Xylene	1.3	U		PPBV	F	JGJ-070-05
4VP029013A	GSP2-2	12.5	Styrene	1.3	U		PPBV	F	JGJ-070-05
4VP029013A	GSP2-2	12.5	Tetrachloroethene	260	D		PPBV	F	JGJ-070-05
4VP029013A	GSP2-2	12.5	Toluene	1.3	U		PPBV	F	JGJ-070-05
4VP029013A	GSP2-2	12.5	trans-1,2-Dichloroethene	9.3			PPBV	F	JGJ-070-05
4VP029013A	GSP2-2	12.5	trans-1,3-Dichloropropene	1.3	U		PPBV	F	JGJ-070-05
4VP029013A	GSP2-2	12.5	Trichloroethene	120			PPBV	F	JGJ-070-05
4VP029013A	GSP2-2	12.5	Trichlorofluoromethane	640	D		PPBV	F	JGJ-070-05
4VP029013A	GSP2-2	12.5	Vinyl Chloride	1.3	U		PPBV	F	JGJ-070-05
4VP030013A	GSP2-2	37.5	1,1,1-Trichloroethane	760	D		PPBV	F	JGJ-070-05
4VP030013A	GSP2-2	37.5	1,1,2,2-Tetrachloroethane	1.3	U		PPBV	F	JGJ-070-05
4VP030013A	GSP2-2	37.5	1,1,2-Trichloroethane	1.3	U		PPBV	F	JGJ-070-05
4VP030013A	GSP2-2	37.5	1,1,2-Trichlorotrifluoroethane	220	D		PPBV	F	JGJ-070-05
4VP030013A	GSP2-2	37.5	1,1-Dichloroethane	2500	D		PPBV	F	JGJ-070-05
4VP030013A	GSP2-2	37.5	1,1-Dichloroethene	62			PPBV	F	JGJ-070-05
4VP030013A	GSP2-2	37.5	1,2,4-Trichlorobenzene	1.4	U		PPBV	F	JGJ-070-05
4VP030013A	GSP2-2	37.5	1,2,4-Trimethylbenzene	1.3	U		PPBV	F	JGJ-070-05
4VP030013A	GSP2-2	37.5	1,2-Dibromoethane	1.3	U		PPBV	F	JGJ-070-05
4VP030013A	GSP2-2	37.5	1,2-Dichlorobenzene	8.4			PPBV	F	JGJ-070-05
4VP030013A	GSP2-2	37.5	1,2-Dichloroethane	1.9			PPBV	F	JGJ-070-05
4VP030013A	GSP2-2	37.5	1,2-Dichloropropane	36			PPBV	F	JGJ-070-05
4VP030013A	GSP2-2	37.5	1,3,5-Trimethylbenzene	1.3	U		PPBV	F	JGJ-070-05
4VP030013A	GSP2-2	37.5	1,3-Dichlorobenzene	1.3	U		PPBV	F	JGJ-070-05
4VP030013A	GSP2-2	37.5	1,4-Dichlorobenzene	1.3	U		PPBV	F	JGJ-070-05
4VP030013A	GSP2-2	37.5	2-Butanone	1.3	U		PPBV	F	JGJ-070-05
4VP030013A	GSP2-2	37.5	2-Hexanone	1.1	U		PPBV	F	JGJ-070-05
4VP030013A	GSP2-2	37.5	4-Ethyltoluene	1.3	U		PPBV	F	JGJ-070-05
4VP030013A	GSP2-2	37.5	4-Methyl-2-pentanone	1.3	U		PPBV	F	JGJ-070-05
4VP030013A	GSP2-2	37.5	ACETIC ACID, CHLOROFUORO-, ETHYL	73	NJ		PPBV	T	
4VP030013A	GSP2-2	37.5	Acetone	3.4		U	PPBV	F	JGJ-070-05
4VP030013A	GSP2-2	37.5	Benzene	7.6			PPBV	F	JGJ-070-05
4VP030013A	GSP2-2	37.5	Benzyl chloride	1.3	U		PPBV	F	JGJ-070-05
4VP030013A	GSP2-2	37.5	Bromomethane	1.2	U		PPBV	F	JGJ-070-05
4VP030013A	GSP2-2	37.5	BUTANAMIDE, 2,2,3,3,4,4,4-HEPTAFLUORO-N	1.5	NJ	NJ	PPBV	T	
4VP030013A	GSP2-2	37.5	Carbon disulfide	1.3	U		PPBV	F	JGJ-070-05
4VP030013A	GSP2-2	37.5	Carbon tetrachloride	2.6			PPBV	F	JGJ-070-05
4VP030013A	GSP2-2	37.5	Chlorobenzene	27			PPBV	F	JGJ-070-05
4VP030013A	GSP2-2	37.5	Chloroethane	25			PPBV	F	JGJ-070-05
4VP030013A	GSP2-2	37.5	Chloroform	20			PPBV	F	JGJ-070-05
4VP030013A	GSP2-2	37.5	Chloromethane	1.3	U		PPBV	F	JGJ-070-05
4VP030013A	GSP2-2	37.5	cis-1,2-Dichloroethene	1600	D		PPBV	F	JGJ-070-05
4VP030013A	GSP2-2	37.5	cis-1,3-Dichloropropene	1.3	U		PPBV	F	JGJ-070-05
4VP030013A	GSP2-2	37.5	CYCLOHEXANE	22	NJ		PPBV	T	
4VP030013A	GSP2-2	37.5	CYCLOTETRASILOXANE, OCTAMETHYL-	3.2	NJ	R	PPBV	T	
4VP030013A	GSP2-2	37.5	Dichlorodifluoromethane	1500	D		PPBV	F	JGJ-070-05
4VP030013A	GSP2-2	37.5	Dichlortetrafluoroethane	4.9			PPBV	F	JGJ-070-05
4VP030013A	GSP2-2	37.5	ETHANE, 1,2-DICHLORO-1,1,2-TRIFLUORO-	40	NJ	NJ	PPBV	T	
4VP030013A	GSP2-2	37.5	ETHANE, 1-CHLORO-1,1-DIFLUORO-	10	NJ	NJ	PPBV	T	
4VP030013A	GSP2-2	37.5	ETHENE, CHLOROTRIFLUORO-	96	NJ	NJ	PPBV	T	
4VP030013A	GSP2-2	37.5	ETHYL ETHER	16	NJ	NJ	PPBV	T	
4VP030013A	GSP2-2	37.5	ETHYL LAMINE	16	NJ	NJ	PPBV	T	
4VP030013A	GSP2-2	37.5	Ethylbenzene	1.3	U		PPBV	F	JGJ-070-05
4VP030013A	GSP2-2	37.5	Hexachlorobutadiene	1.3	U		PPBV	F	JGJ-070-05
4VP030013A	GSP2-2	37.5	ISOBUTANE	210	NJ	NJ	PPBV	T	
4VP030013A	GSP2-2	37.5	m,p-Xylenes	2.6	U		PPBV	F	JGJ-070-05
4VP030013A	GSP2-2	37.5	Methane	3.27		U	PPMV	F	DMG-195-05
4VP030013A	GSP2-2	37.5	METHANE, CHLORODIFLUORO-	76	NJ	NJ	PPBV	T	
4VP030013A	GSP2-2	37.5	METHANE, DICHLOROFUORO-	73	NJ	NJ	PPBV	T	
4VP030013A	GSP2-2	37.5	Methylene Chloride	23			PPBV	F	JGJ-070-05
4VP030013A	GSP2-2	37.5	o-Xylene	1.3	U		PPBV	F	JGJ-070-05
4VP030013A	GSP2-2	37.5	PENTANE, 3-METHYL-	2.6	NJ	NJ	PPBV	T	
4VP030013A	GSP2-2	37.5	Styrene	1.3	U		PPBV	F	JGJ-070-05
4VP030013A	GSP2-2	37.5	Tetrachloroethene	440	D		PPBV	F	JGJ-070-05
4VP030013A	GSP2-2	37.5	Toluene	1.3	U		PPBV	F	JGJ-070-05
4VP030013A	GSP2-2	37.5	trans-1,2-Dichloroethene	5.5			PPBV	F	JGJ-070-05
4VP030013A	GSP2-2	37.5	trans-1,3-Dichloropropene	1.3	U		PPBV	F	JGJ-070-05
4VP030013A	GSP2-2	37.5	Trichloroethene	280	D		PPBV	F	JGJ-070-05

Table A-3. (continued).

Field Sample Number	Location	Depth	Compound	Sample Result	Result Qualifier	Validation Flag	Sample Units	Organic TIC	L&V Report Number
4VP030013A	GSP2-2	37.5	Trichlorofluoromethane	1100	D		PPBV	F	JGJ-070-05
4VP030013A	GSP2-2	37.5	Vinyl Chloride	1.3	U		PPBV	F	JGJ-070-05
4VP031013A	GSP2-2	77.5	1,1,1-Trichloroethane	61			PPBV	F	JGJ-070-05
4VP031013A	GSP2-2	77.5	1,1,2,2-Tetrachloroethane	1.1	U		PPBV	F	JGJ-070-05
4VP031013A	GSP2-2	77.5	1,1,2-Trichloroethane	1.1	U		PPBV	F	JGJ-070-05
4VP031013A	GSP2-2	77.5	1,1,2-Trichlorotrifluoroethane	34			PPBV	F	JGJ-070-05
4VP031013A	GSP2-2	77.5	1,1-Dichloroethane	110			PPBV	F	JGJ-070-05
4VP031013A	GSP2-2	77.5	1,1-Dichloroethene	9.3			PPBV	F	JGJ-070-05
4VP031013A	GSP2-2	77.5	1,2,4-Trichlorobenzene	1.2	U		PPBV	F	JGJ-070-05
4VP031013A	GSP2-2	77.5	1,2,4-Trimethylbenzene	2.2			PPBV	F	JGJ-070-05
4VP031013A	GSP2-2	77.5	1,2-Dibromoethane	1.1	U		PPBV	F	JGJ-070-05
4VP031013A	GSP2-2	77.5	1,2-Dichlorobenzene	1.1	U		PPBV	F	JGJ-070-05
4VP031013A	GSP2-2	77.5	1,2-Dichloroethane	1.1	U		PPBV	F	JGJ-070-05
4VP031013A	GSP2-2	77.5	1,2-Dichloropropane	2.3			PPBV	F	JGJ-070-05
4VP031013A	GSP2-2	77.5	1,3,5-Trimethylbenzene	1.1	U		PPBV	F	JGJ-070-05
4VP031013A	GSP2-2	77.5	1,3-Dichlorobenzene	1.1	U		PPBV	F	JGJ-070-05
4VP031013A	GSP2-2	77.5	1,4-Dichlorobenzene	1.1	U		PPBV	F	JGJ-070-05
4VP031013A	GSP2-2	77.5	2-Butanone	4.2			PPBV	F	JGJ-070-05
4VP031013A	GSP2-2	77.5	2-Hexanone	0.98	U		PPBV	F	JGJ-070-05
4VP031013A	GSP2-2	77.5	4-Ethyltoluene	1.1	U		PPBV	F	JGJ-070-05
4VP031013A	GSP2-2	77.5	4-Methyl-2-pentanone	1.2			PPBV	F	JGJ-070-05
4VP031013A	GSP2-2	77.5	ACETIC ACID, CHLOROFLUORO-, ETHYL	4.1	NJ	NJ	PPBV	T	
4VP031013A	GSP2-2	77.5	Acetone	23		U	PPBV	F	JGJ-070-05
4VP031013A	GSP2-2	77.5	Benzene	1.7			PPBV	F	JGJ-070-05
4VP031013A	GSP2-2	77.5	Benzyl chloride	1.1	U		PPBV	F	JGJ-070-05
4VP031013A	GSP2-2	77.5	Bromomethane	1	U		PPBV	F	JGJ-070-05
4VP031013A	GSP2-2	77.5	BUTANE	6	NJ	NJ	PPBV	T	
4VP031013A	GSP2-2	77.5	BUTANE, 2,3-DIMETHYL-	8.5	NJ	NJ	PPBV	T	
4VP031013A	GSP2-2	77.5	BUTANE, 2-METHYL-	180	NJ	NJ	PPBV	T	
4VP031013A	GSP2-2	77.5	Carbon disulfide	1.1	U		PPBV	F	JGJ-070-05
4VP031013A	GSP2-2	77.5	Carbon tetrachloride	2			PPBV	F	JGJ-070-05
4VP031013A	GSP2-2	77.5	Chlorobenzene	1.5			PPBV	F	JGJ-070-05
4VP031013A	GSP2-2	77.5	Chloroethane	1.9			PPBV	F	JGJ-070-05
4VP031013A	GSP2-2	77.5	Chloroform	1.9			PPBV	F	JGJ-070-05
4VP031013A	GSP2-2	77.5	Chloromethane	1.1	U		PPBV	F	JGJ-070-05
4VP031013A	GSP2-2	77.5	cis-1,2-Dichloroethene	45			PPBV	F	JGJ-070-05
4VP031013A	GSP2-2	77.5	cis-1,3-Dichloropropene	1.1	U		PPBV	F	JGJ-070-05
4VP031013A	GSP2-2	77.5	CYCLOPENTANE, METHYL-	5.8	NJ	NJ	PPBV	T	
4VP031013A	GSP2-2	77.5	DECANE	3.3	NJ	NJ	PPBV	T	
4VP031013A	GSP2-2	77.5	Dichlorodifluoromethane	100			PPBV	F	JGJ-070-05
4VP031013A	GSP2-2	77.5	Dichlortetrafluoroethane	1.2	U		PPBV	F	JGJ-070-05
4VP031013A	GSP2-2	77.5	D-LIMONENE	3.8	J	J	PPBV	T	
4VP031013A	GSP2-2	77.5	ETHANE, 1,2-DICHLORO-1,1,2-TRIFLUORO-	6.5	NJ	NJ	PPBV	T	
4VP031013A	GSP2-2	77.5	ETHANE, 1-CHLORO-1,1-DIFLUORO-	7.5	NJ	NJ	PPBV	T	
4VP031013A	GSP2-2	77.5	ETHENE, CHLOROTRIFLUORO-	12	NJ	NJ	PPBV	T	
4VP031013A	GSP2-2	77.5	Ethylbenzene	5			PPBV	F	JGJ-070-05
4VP031013A	GSP2-2	77.5	Hexachlorobutadiene	1.1	U		PPBV	F	JGJ-070-05
4VP031013A	GSP2-2	77.5	HEXANAL	3.4	NJ	NJ	PPBV	T	
4VP031013A	GSP2-2	77.5	ISOBUTANE	120	NJ	NJ	PPBV	T	
4VP031013A	GSP2-2	77.5	m,p-Xylenes	16			PPBV	F	JGJ-070-05
4VP031013A	GSP2-2	77.5	Methane	2.54		U	PPMV	F	DMG-195-05
4VP031013A	GSP2-2	77.5	METHANE, CHLORODIFLUORO-	11	NJ	NJ	PPBV	T	
4VP031013A	GSP2-2	77.5	METHANE, DICHLOROFUORO-	31	NJ	NJ	PPBV	T	
4VP031013A	GSP2-2	77.5	Methylene Chloride	3.4			PPBV	F	JGJ-070-05
4VP031013A	GSP2-2	77.5	OCTANE, 2,2,6-TRIMETHYL-	3.9	NJ	NJ	PPBV	T	
4VP031013A	GSP2-2	77.5	o-Xylene	4.4			PPBV	F	JGJ-070-05
4VP031013A	GSP2-2	77.5	PENTANE	40	NJ	NJ	PPBV	T	
4VP031013A	GSP2-2	77.5	PENTANE, 3-METHYL-	7.1	NJ	NJ	PPBV	T	
4VP031013A	GSP2-2	77.5	Styrene	2			PPBV	F	JGJ-070-05
4VP031013A	GSP2-2	77.5	Tetrachloroethene	29			PPBV	F	JGJ-070-05
4VP031013A	GSP2-2	77.5	Toluene	32			PPBV	F	JGJ-070-05
4VP031013A	GSP2-2	77.5	trans-1,2-Dichloroethene	1.2	U		PPBV	F	JGJ-070-05
4VP031013A	GSP2-2	77.5	trans-1,3-Dichloropropene	1.1	U		PPBV	F	JGJ-070-05
4VP031013A	GSP2-2	77.5	Trichloroethene	20			PPBV	F	JGJ-070-05
4VP031013A	GSP2-2	77.5	Trichlorofluoromethane	170	D		PPBV	F	JGJ-070-05
4VP031013A	GSP2-2	77.5	UNKNOWN1	12	J	J	PPBV	T	
4VP031013A	GSP2-2	77.5	UNKNOWN2	18	J	J	PPBV	T	
4VP031013A	GSP2-2	77.5	Vinyl Chloride	1.1	U		PPBV	F	JGJ-070-05
4VP032013A	GSP2-2	107.5	1,1,1-Trichloroethane	780	D		PPBV	F	JGJ-070-05
4VP032013A	GSP2-2	107.5	1,1,2,2-Tetrachloroethane	1.2	U		PPBV	F	JGJ-070-05
4VP032013A	GSP2-2	107.5	1,1,2-Trichloroethane	1.2	U		PPBV	F	JGJ-070-05
4VP032013A	GSP2-2	107.5	1,1,2-Trichlorotrifluoroethane	480	D		PPBV	F	JGJ-070-05
4VP032013A	GSP2-2	107.5	1,1-Dichloroethane	1400	D		PPBV	F	JGJ-070-05
4VP032013A	GSP2-2	107.5	1,1-Dichloroethene	81			PPBV	F	JGJ-070-05
4VP032013A	GSP2-2	107.5	1,2,4-Trichlorobenzene	1.3	U		PPBV	F	JGJ-070-05
4VP032013A	GSP2-2	107.5	1,2,4-Trimethylbenzene	1.2	U		PPBV	F	JGJ-070-05
4VP032013A	GSP2-2	107.5	1,2-Dibromoethane	1.2	U		PPBV	F	JGJ-070-05

Table A-3. (continued).

Field Sample Number	Location	Depth	Compound	Sample Result	Result Qualifier	Validation Flag	Sample Units	Organic TIC	L&V Report Number
4VP032013A	GSP2-2	107.5	1,2-Dichlorobenzene	3.7			PPBV	F	JGJ-070-05
4VP032013A	GSP2-2	107.5	1,2-Dichloroethane	1.2	U		PPBV	F	JGJ-070-05
4VP032013A	GSP2-2	107.5	1,2-Dichloropropane	9.6			PPBV	F	JGJ-070-05
4VP032013A	GSP2-2	107.5	1,3,5-Trimethylbenzene	1.2	U		PPBV	F	JGJ-070-05
4VP032013A	GSP2-2	107.5	1,3-Dichlorobenzene	1.2	U		PPBV	F	JGJ-070-05
4VP032013A	GSP2-2	107.5	1,4-Dichlorobenzene	1.2	U		PPBV	F	JGJ-070-05
4VP032013A	GSP2-2	107.5	1-HEXANOL, 2-ETHYL-	1.4	NJ	NJ	PPBV	T	
4VP032013A	GSP2-2	107.5	2-Butanone	1.2	U		PPBV	F	JGJ-070-05
4VP032013A	GSP2-2	107.5	2-Hexanone	1	U		PPBV	F	JGJ-070-05
4VP032013A	GSP2-2	107.5	4-Ethyltoluene	1.2	U		PPBV	F	JGJ-070-05
4VP032013A	GSP2-2	107.5	4-Methyl-2-pentanone	1.2	U		PPBV	F	JGJ-070-05
4VP032013A	GSP2-2	107.5	ACETIC ACID, CHLOROFLUORO-, ETHYL	22	NJ	NJ	PPBV	T	
4VP032013A	GSP2-2	107.5	Acetone	5.2		U	PPBV	F	JGJ-070-05
4VP032013A	GSP2-2	107.5	Benzene	2.9			PPBV	F	JGJ-070-05
4VP032013A	GSP2-2	107.5	Benzyl chloride	1.2	U		PPBV	F	JGJ-070-05
4VP032013A	GSP2-2	107.5	Bromomethane	1.1	U		PPBV	F	JGJ-070-05
4VP032013A	GSP2-2	107.5	BUTANAMIDE, 2,2,3,3,4,4,4-HEPTAFLUORO-N	1.2	NJ	NJ	PPBV	T	
4VP032013A	GSP2-2	107.5	BUTANE	2.4	NJ	NJ	PPBV	T	
4VP032013A	GSP2-2	107.5	Carbon disulfide	1.2	U		PPBV	F	JGJ-070-05
4VP032013A	GSP2-2	107.5	Carbon tetrachloride	23			PPBV	F	JGJ-070-05
4VP032013A	GSP2-2	107.5	Chlorobenzene	2.5			PPBV	F	JGJ-070-05
4VP032013A	GSP2-2	107.5	Chloroethane	11			PPBV	F	JGJ-070-05
4VP032013A	GSP2-2	107.5	Chloroform	14			PPBV	F	JGJ-070-05
4VP032013A	GSP2-2	107.5	Chloromethane	1.2	U		PPBV	F	JGJ-070-05
4VP032013A	GSP2-2	107.5	cis-1,2-Dichloroethene	250	D		PPBV	F	JGJ-070-05
4VP032013A	GSP2-2	107.5	cis-1,3-Dichloropropene	1.2	U		PPBV	F	JGJ-070-05
4VP032013A	GSP2-2	107.5	CYCLOHEXANE	1.7	NJ	NJ	PPBV	T	
4VP032013A	GSP2-2	107.5	Dichlorodifluoromethane	2200	D		PPBV	F	JGJ-070-05
4VP032013A	GSP2-2	107.5	Dichlortetrafluoroethane	6.9			PPBV	F	JGJ-070-05
4VP032013A	GSP2-2	107.5	ETHANE, 1,2-DICHLORO-1,1,2-TRIFLUORO-	38	NJ	NJ	PPBV	T	
4VP032013A	GSP2-2	107.5	ETHANE, 1-CHLORO-1,1-DIFLUORO-	32	NJ	NJ	PPBV	T	
4VP032013A	GSP2-2	107.5	ETHENE, CHLOROTRIFLUORO-	67	NJ	NJ	PPBV	T	
4VP032013A	GSP2-2	107.5	ETHYL ETHER	5.9	NJ	NJ	PPBV	T	
4VP032013A	GSP2-2	107.5	Ethylbenzene	1.2	U		PPBV	F	JGJ-070-05
4VP032013A	GSP2-2	107.5	Hexachlorobutadiene	1.2	U		PPBV	F	JGJ-070-05
4VP032013A	GSP2-2	107.5	ISOBUTANE	100	NJ	NJ	PPBV	T	
4VP032013A	GSP2-2	107.5	m,p-Xylenes	2.4	U		PPBV	F	JGJ-070-05
4VP032013A	GSP2-2	107.5	Methane	4.3		U	PPMV	F	DMG-195-05
4VP032013A	GSP2-2	107.5	METHANE, CHLORODIFLUORO-	54	NJ	NJ	PPBV	T	
4VP032013A	GSP2-2	107.5	METHANE, DICHLOROFUORO-	120	NJ	NJ	PPBV	T	
4VP032013A	GSP2-2	107.5	Methylene Chloride	1.6			PPBV	F	JGJ-070-05
4VP032013A	GSP2-2	107.5	o-Xylene	1.2	U		PPBV	F	JGJ-070-05
4VP032013A	GSP2-2	107.5	Styrene	1.2	U		PPBV	F	JGJ-070-05
4VP032013A	GSP2-2	107.5	Tetrachloroethene	400	D		PPBV	F	JGJ-070-05
4VP032013A	GSP2-2	107.5	Toluene	1.2	U		PPBV	F	JGJ-070-05
4VP032013A	GSP2-2	107.5	trans-1,2-Dichloroethene	1.2	U		PPBV	F	JGJ-070-05
4VP032013A	GSP2-2	107.5	trans-1,3-Dichloropropene	1.2	U		PPBV	F	JGJ-070-05
4VP032013A	GSP2-2	107.5	Trichloroethene	200	D		PPBV	F	JGJ-070-05
4VP032013A	GSP2-2	107.5	Trichlorofluoromethane	4300	D		PPBV	F	JGJ-070-05
4VP032013A	GSP2-2	107.5	UNKNOWN1	68	J	J	PPBV	T	
4VP032013A	GSP2-2	107.5	Vinyl Chloride	1.2	U		PPBV	F	JGJ-070-05
4VP033013A	GSP3-1	12.5	1,1,1-Trichloroethane	86			PPBV	F	JGJ-070-05
4VP033013A	GSP3-1	12.5	1,1,2-Tetrachloroethane	1.1	U		PPBV	F	JGJ-070-05
4VP033013A	GSP3-1	12.5	1,1,2-Trichloroethane	1.1	U		PPBV	F	JGJ-070-05
4VP033013A	GSP3-1	12.5	1,1,2-Trichlorotrifluoroethane	24			PPBV	F	JGJ-070-05
4VP033013A	GSP3-1	12.5	1,1-Dichloroethane	21			PPBV	F	JGJ-070-05
4VP033013A	GSP3-1	12.5	1,1-Dichloroethene	44			PPBV	F	JGJ-070-05
4VP033013A	GSP3-1	12.5	1,2,4-Trichlorobenzene	1.2	U		PPBV	F	JGJ-070-05
4VP033013A	GSP3-1	12.5	1,2,4-Trimethylbenzene	1.3			PPBV	F	JGJ-070-05
4VP033013A	GSP3-1	12.5	1,2-Dibromoethane	1.1	U		PPBV	F	JGJ-070-05
4VP033013A	GSP3-1	12.5	1,2-Dichlorobenzene	1.1	U		PPBV	F	JGJ-070-05
4VP033013A	GSP3-1	12.5	1,2-Dichloroethane	1.1	U		PPBV	F	JGJ-070-05
4VP033013A	GSP3-1	12.5	1,2-Dichloropropane	1.1	U		PPBV	F	JGJ-070-05
4VP033013A	GSP3-1	12.5	1,3,5-Trimethylbenzene	1.1	U		PPBV	F	JGJ-070-05
4VP033013A	GSP3-1	12.5	1,3-Dichlorobenzene	1.1	U		PPBV	F	JGJ-070-05
4VP033013A	GSP3-1	12.5	1,4-Dichlorobenzene	1.1	U		PPBV	F	JGJ-070-05
4VP033013A	GSP3-1	12.5	1R-ALPHA.-PINENE	3.7	J	J	PPBV	T	
4VP033013A	GSP3-1	12.5	2-Butanone	5.9			PPBV	F	JGJ-070-05
4VP033013A	GSP3-1	12.5	2-Hexanone	0.98	U		PPBV	F	JGJ-070-05
4VP033013A	GSP3-1	12.5	4-Ethyltoluene	1.1	U		PPBV	F	JGJ-070-05
4VP033013A	GSP3-1	12.5	4-Methyl-2-pentanone	1.7			PPBV	F	JGJ-070-05
4VP033013A	GSP3-1	12.5	Acetone	16		U	PPBV	F	JGJ-070-05
4VP033013A	GSP3-1	12.5	Benzene	1.1	U		PPBV	F	JGJ-070-05
4VP033013A	GSP3-1	12.5	Benzyl chloride	1.1	U		PPBV	F	JGJ-070-05
4VP033013A	GSP3-1	12.5	BICYCLO[3.1.1]HEPT-2-ENE,	3.1	NJ	NJ	PPBV	T	
4VP033013A	GSP3-1	12.5	Bromomethane	1.5			PPBV	F	JGJ-070-05
4VP033013A	GSP3-1	12.5	BUTANAL, 3-METHYL-	2	NJ	NJ	PPBV	T	

Table A-3. (continued).

Field Sample	Number	Location	Depth	Compound	Sample Result	Result Qualifier	Validation Flag	Sample Units	Organic TIC	L&V Report Number
4VP033013A	GSP3-1	12.5	BUTANE, 2-METHYL-	81	NJ	NJ	PPBV	T	JGJ-070-05	
4VP033013A	GSP3-1	12.5	Carbon disulfide	1.1	U		PPBV	F	JGJ-070-05	
4VP033013A	GSP3-1	12.5	Carbon tetrachloride	1.1	U		PPBV	F	JGJ-070-05	
4VP033013A	GSP3-1	12.5	Chlorobenzene	1.1	U		PPBV	F	JGJ-070-05	
4VP033013A	GSP3-1	12.5	Chloroethane	1.1	U		PPBV	F	JGJ-070-05	
4VP033013A	GSP3-1	12.5	Chloroform	1.4			PPBV	F	JGJ-070-05	
4VP033013A	GSP3-1	12.5	Chloromethane	1.1	U		PPBV	F	JGJ-070-05	
4VP033013A	GSP3-1	12.5	cis-1,2-Dichloroethene	1.7			PPBV	F	JGJ-070-05	
4VP033013A	GSP3-1	12.5	cis-1,3-Dichloropropene	1.1	U		PPBV	F	JGJ-070-05	
4VP033013A	GSP3-1	12.5	CYCLOHEXANONE	3.9	NJ	NJ	PPBV	T		
4VP033013A	GSP3-1	12.5	CYCLOTETRASILOXANE, OCTAMETHYL-	2.2	NJ	R	PPBV	T		
4VP033013A	GSP3-1	12.5	CYCLOTRISILOXANE, HEXAMETHYL-	3.8	NJ	R	PPBV	T		
4VP033013A	GSP3-1	12.5	Dichlorodifluoromethane	30			PPBV	F	JGJ-070-05	
4VP033013A	GSP3-1	12.5	Dichlorotetrafluoroethane	1.2	U		PPBV	F	JGJ-070-05	
4VP033013A	GSP3-1	12.5	D-LIMONENE	25	J	J	PPBV	T		
4VP033013A	GSP3-1	12.5	Ethylbenzene	1.6			PPBV	F	JGJ-070-05	
4VP033013A	GSP3-1	12.5	Hexachlorobutadiene	1.1	U		PPBV	F	JGJ-070-05	
4VP033013A	GSP3-1	12.5	HEXANAL	3.6	NJ	NJ	PPBV	T		
4VP033013A	GSP3-1	12.5	HEXANE, 2,2,4-TRIMETHYL-	3	NJ	NJ	PPBV	T		
4VP033013A	GSP3-1	12.5	ISOBUTANE	35	NJ	NJ	PPBV	T		
4VP033013A	GSP3-1	12.5	ISOPROPYL ALCOHOL	8.7	NJ	NJ	PPBV	T		
4VP033013A	GSP3-1	12.5	m,p-Xylenes	3.8			PPBV	F	JGJ-070-05	
4VP033013A	GSP3-1	12.5	Methane	2.09		U	PPMV	F	DMG-195-05	
4VP033013A	GSP3-1	12.5	METHANE, DICHLOROFLUORO-	4.3	NJ	NJ	PPBV	T		
4VP033013A	GSP3-1	12.5	Methylene Chloride	6.2			PPBV	F	JGJ-070-05	
4VP033013A	GSP3-1	12.5	OCTANE, 2,2,6-TRIMETHYL-	2.6	NJ	NJ	PPBV	T		
4VP033013A	GSP3-1	12.5	o-Xylene	1.5			PPBV	F	JGJ-070-05	
4VP033013A	GSP3-1	12.5	PENTANE	5.4	NJ	NJ	PPBV	T		
4VP033013A	GSP3-1	12.5	PENTANE, 2-METHYL-	2.5	NJ	NJ	PPBV	T		
4VP033013A	GSP3-1	12.5	Styrene	1.2			PPBV	F	JGJ-070-05	
4VP033013A	GSP3-1	12.5	Tetrachloroethene	1.8			PPBV	F	JGJ-070-05	
4VP033013A	GSP3-1	12.5	Toluene	30			PPBV	F	JGJ-070-05	
4VP033013A	GSP3-1	12.5	trans-1,2-Dichloroethene	1.2	U		PPBV	F	JGJ-070-05	
4VP033013A	GSP3-1	12.5	trans-1,3-Dichloropropene	1.1	U		PPBV	F	JGJ-070-05	
4VP033013A	GSP3-1	12.5	Trichloroethene	5.4			PPBV	F	JGJ-070-05	
4VP033013A	GSP3-1	12.5	Trichlorofluoromethane	27			PPBV	F	JGJ-070-05	
4VP033013A	GSP3-1	12.5	UNDECANE, 5-ETHYL-	2	NJ	NJ	PPBV	T		
4VP033013A	GSP3-1	12.5	UNKNOWN1	3.7	J	J	PPBV	T		
4VP033013A	GSP3-1	12.5	UNKNOWN2	2.4	J	J	PPBV	T		
4VP033013A	GSP3-1	12.5	Vinyl Chloride	1.1	U		PPBV	F	JGJ-070-05	
4VP034013A	GSP3-1	37.5	1,1,1-Trichloroethane	3200	D		PPBV	F	JGJ-070-05	
4VP034013A	GSP3-1	37.5	1,1,2-Tetrachloroethane	1.3	U		PPBV	F	JGJ-070-05	
4VP034013A	GSP3-1	37.5	1,1,2-Trichloroethane	1.3	U		PPBV	F	JGJ-070-05	
4VP034013A	GSP3-1	37.5	1,1,2-Trichlorotrifluoroethane	1400	D		PPBV	F	JGJ-070-05	
4VP034013A	GSP3-1	37.5	1,1-Dichloroethane	880	D		PPBV	F	JGJ-070-05	
4VP034013A	GSP3-1	37.5	1,1-Dichloroethene	1100	D		PPBV	F	JGJ-070-05	
4VP034013A	GSP3-1	37.5	1,2,4-Trichlorobenzene	1.4	U		PPBV	F	JGJ-070-05	
4VP034013A	GSP3-1	37.5	1,2,4-Trimethylbenzene	1.3	U		PPBV	F	JGJ-070-05	
4VP034013A	GSP3-1	37.5	1,2-Dibromoethane	1.3	U		PPBV	F	JGJ-070-05	
4VP034013A	GSP3-1	37.5	1,2-Dichlorobenzene	1.3	U		PPBV	F	JGJ-070-05	
4VP034013A	GSP3-1	37.5	1,2-Dichloroethane	19			PPBV	F	JGJ-070-05	
4VP034013A	GSP3-1	37.5	1,2-Dichloropropane	13			PPBV	F	JGJ-070-05	
4VP034013A	GSP3-1	37.5	1,3,5-Trimethylbenzene	1.3	U		PPBV	F	JGJ-070-05	
4VP034013A	GSP3-1	37.5	1,3-Dichlorobenzene	1.3	U		PPBV	F	JGJ-070-05	
4VP034013A	GSP3-1	37.5	1,4-Dichlorobenzene	1.3	U		PPBV	F	JGJ-070-05	
4VP034013A	GSP3-1	37.5	2-Butanone	1.3	U		PPBV	F	JGJ-070-05	
4VP034013A	GSP3-1	37.5	2-Hexanone	1.1	U		PPBV	F	JGJ-070-05	
4VP034013A	GSP3-1	37.5	2-PYRROLIDINONE, 1-METHYL-	1.3	NJ	NJ	PPBV	T		
4VP034013A	GSP3-1	37.5	4-Ethyltoluene	1.3	U		PPBV	F	JGJ-070-05	
4VP034013A	GSP3-1	37.5	4-Methyl-2-pentanone	1.3	U		PPBV	F	JGJ-070-05	
4VP034013A	GSP3-1	37.5	ACETIC ACID, CHLOROFLUORO-, ETHYL	8.6	NJ	NJ	PPBV	T		
4VP034013A	GSP3-1	37.5	Acetone	6.4			PPBV	F	JGJ-070-05	
4VP034013A	GSP3-1	37.5	Benzene	1.3	U		PPBV	F	JGJ-070-05	
4VP034013A	GSP3-1	37.5	Benzyl chloride	1.3	U		PPBV	F	JGJ-070-05	
4VP034013A	GSP3-1	37.5	Bromomethane	1.2	U		PPBV	F	JGJ-070-05	
4VP034013A	GSP3-1	37.5	BUTANE, 2,2-DIMETHYL-	2.9	NJ	NJ	PPBV	T		
4VP034013A	GSP3-1	37.5	BUTANE, 2-METHYL-	2.3	NJ	NJ	PPBV	T		
4VP034013A	GSP3-1	37.5	Carbon disulfide	1.3	U		PPBV	F	JGJ-070-05	
4VP034013A	GSP3-1	37.5	Carbon tetrachloride	1.3	U		PPBV	F	JGJ-070-05	
4VP034013A	GSP3-1	37.5	Chlorobenzene	1.3	U		PPBV	F	JGJ-070-05	
4VP034013A	GSP3-1	37.5	Chloroethane	1.2	U		PPBV	F	JGJ-070-05	
4VP034013A	GSP3-1	37.5	Chloroform	32			PPBV	F	JGJ-070-05	
4VP034013A	GSP3-1	37.5	Chloromethane	1.3	U		PPBV	F	JGJ-070-05	
4VP034013A	GSP3-1	37.5	cis-1,2-Dichloroethene	35			PPBV	F	JGJ-070-05	
4VP034013A	GSP3-1	37.5	cis-1,3-Dichloropropene	1.3	U		PPBV	F	JGJ-070-05	
4VP034013A	GSP3-1	37.5	CYCLOHEXANE	2.6	NJ	NJ	PPBV	T		
4VP034013A	GSP3-1	37.5	CYCLOTETRASILOXANE, OCTAMETHYL-	7.9	NJ	R	PPBV	T		

Table A-3. (continued).

Field Sample	Number	Location	Depth	Compound	Sample Result	Result Qualifier	Validation Flag	Sample Units	Organic TIC	L&V Report Number
4VP034013A	GSP3-1	37.5	CYCLOTRISILOXANE, HEXAMETHYL-	1.4	NJ	R	PPBV	T		
4VP034013A	GSP3-1	37.5	Dichlorodifluoromethane	2200	D		PPBV	F	JGJ-070-05	
4VP034013A	GSP3-1	37.5	Dichlortetrafluoroethane	4.6			PPBV	F	JGJ-070-05	
4VP034013A	GSP3-1	37.5	D-LIMONENE	1.4	J	J	PPBV	T		
4VP034013A	GSP3-1	37.5	ETHANE, 1,2-DICHLORO-1,1,2-TRIFLUORO-	46	NJ	NJ	PPBV	T		
4VP034013A	GSP3-1	37.5	ETHANE, 1-CHLORO-1,1-DIFLUORO-	20	NJ	NJ	PPBV	T		
4VP034013A	GSP3-1	37.5	ETHENE, CHLOROTRIFLUORO-	54	NJ	NJ	PPBV	T		
4VP034013A	GSP3-1	37.5	ETHYL ETHER	5.5	NJ	NJ	PPBV	T		
4VP034013A	GSP3-1	37.5	Ethylbenzene	1.3	U		PPBV	F	JGJ-070-05	
4VP034013A	GSP3-1	37.5	Hexachlorobutadiene	1.3	U		PPBV	F	JGJ-070-05	
4VP034013A	GSP3-1	37.5	ISOBUTANE	70	NJ	NJ	PPBV	T		
4VP034013A	GSP3-1	37.5	m,p-Xylenes	2.6	U		PPBV	F	JGJ-070-05	
4VP034013A	GSP3-1	37.5	Methane	5.13		U	PPMV	F	DMG-195-05	
4VP034013A	GSP3-1	37.5	METHANE, CHLORODIFLUORO-	16	NJ	NJ	PPBV	T		
4VP034013A	GSP3-1	37.5	METHANE, DICHLOROFUORO-	130	NJ	NJ	PPBV	T		
4VP034013A	GSP3-1	37.5	Methylene Chloride	16			PPBV	F	JGJ-070-05	
4VP034013A	GSP3-1	37.5	o-Xylene	1.3	U		PPBV	F	JGJ-070-05	
4VP034013A	GSP3-1	37.5	Styrene	1.3	U		PPBV	F	JGJ-070-05	
4VP034013A	GSP3-1	37.5	Tetrachloroethene	450	D		PPBV	F	JGJ-070-05	
4VP034013A	GSP3-1	37.5	Toluene	1.3	U		PPBV	F	JGJ-070-05	
4VP034013A	GSP3-1	37.5	trans-1,2-Dichloroethene	2.9			PPBV	F	JGJ-070-05	
4VP034013A	GSP3-1	37.5	trans-1,3-Dichloropropene	1.3	U		PPBV	F	JGJ-070-05	
4VP034013A	GSP3-1	37.5	Trichloroethene	440	D		PPBV	F	JGJ-070-05	
4VP034013A	GSP3-1	37.5	Trichlorofluoromethane	2500	D		PPBV	F	JGJ-070-05	
4VP034013A	GSP3-1	37.5	Vinyl Chloride	1.3	U		PPBV	F	JGJ-070-05	
4VP035013A	GSP3-1	77.5	1,1,1-Trichloroethane	2100	D		PPBV	F	JGJ-070-05	
4VP035013A	GSP3-1	77.5	1,1,2,2-Tetrachloroethane	1.2	U		PPBV	F	JGJ-070-05	
4VP035013A	GSP3-1	77.5	1,1,2-Trichloroethane	1.2	U		PPBV	F	JGJ-070-05	
4VP035013A	GSP3-1	77.5	1,1,2-Trichlorofluorooethane	1400	D		PPBV	F	JGJ-070-05	
4VP035013A	GSP3-1	77.5	1,1-Dichloroethane	500	D		PPBV	F	JGJ-070-05	
4VP035013A	GSP3-1	77.5	1,1-Dichloroethene	1600	D		PPBV	F	JGJ-070-05	
4VP035013A	GSP3-1	77.5	1,2,4-Trichlorobenzene	1.2	U		PPBV	F	JGJ-070-05	
4VP035013A	GSP3-1	77.5	1,2,4-Trimethylbenzene	1.2	U		PPBV	F	JGJ-070-05	
4VP035013A	GSP3-1	77.5	1,2-Dibromoethane	1.2	U		PPBV	F	JGJ-070-05	
4VP035013A	GSP3-1	77.5	1,2-Dichlorobenzene	1.2	U		PPBV	F	JGJ-070-05	
4VP035013A	GSP3-1	77.5	1,2-Dichloroethane	28			PPBV	F	JGJ-070-05	
4VP035013A	GSP3-1	77.5	1,2-Dichloropropane	2			PPBV	F	JGJ-070-05	
4VP035013A	GSP3-1	77.5	1,3,5-Trimethylbenzene	1.2	U		PPBV	F	JGJ-070-05	
4VP035013A	GSP3-1	77.5	1,3-Dichlorobenzene	1.2	U		PPBV	F	JGJ-070-05	
4VP035013A	GSP3-1	77.5	1,4-Dichlorobenzene	1.2	U		PPBV	F	JGJ-070-05	
4VP035013A	GSP3-1	77.5	1-PROPENE, 2-METHYL-	6.8	NJ	NJ	PPBV	T		
4VP035013A	GSP3-1	77.5	2-Butanone	2.7			PPBV	F	JGJ-070-05	
4VP035013A	GSP3-1	77.5	2-Hexanone	0.99	U		PPBV	F	JGJ-070-05	
4VP035013A	GSP3-1	77.5	4-Ethyltoluene	1.2	U		PPBV	F	JGJ-070-05	
4VP035013A	GSP3-1	77.5	4-Methyl-2-pentanone	1.2	U		PPBV	F	JGJ-070-05	
4VP035013A	GSP3-1	77.5	Acetone	13		U	PPBV	F	JGJ-070-05	
4VP035013A	GSP3-1	77.5	Benzene	1.2	U		PPBV	F	JGJ-070-05	
4VP035013A	GSP3-1	77.5	Benzyl chloride	1.2	U		PPBV	F	JGJ-070-05	
4VP035013A	GSP3-1	77.5	Bromomethane	1	U		PPBV	F	JGJ-070-05	
4VP035013A	GSP3-1	77.5	BUTANE	15	NJ	NJ	PPBV	T		
4VP035013A	GSP3-1	77.5	BUTANE, 2-METHYL-	22	NJ	NJ	PPBV	T		
4VP035013A	GSP3-1	77.5	Carbon disulfide	1.2	U		PPBV	F	JGJ-070-05	
4VP035013A	GSP3-1	77.5	Carbon tetrachloride	8.1			PPBV	F	JGJ-070-05	
4VP035013A	GSP3-1	77.5	Chlorobenzene	1.2	U		PPBV	F	JGJ-070-05	
4VP035013A	GSP3-1	77.5	Chloroethane	3.1			PPBV	F	JGJ-070-05	
4VP035013A	GSP3-1	77.5	Chloroform	27			PPBV	F	JGJ-070-05	
4VP035013A	GSP3-1	77.5	Chloromethane	1.2	U		PPBV	F	JGJ-070-05	
4VP035013A	GSP3-1	77.5	cis-1,2-Dichloroethene	1.7			PPBV	F	JGJ-070-05	
4VP035013A	GSP3-1	77.5	cis-1,3-Dichloropropene	1.2	U		PPBV	F	JGJ-070-05	
4VP035013A	GSP3-1	77.5	CYCLOHEXANE	9.1	NJ	NJ	PPBV	T		
4VP035013A	GSP3-1	77.5	CYCLOPENTANE	9.8	NJ	NJ	PPBV	T		
4VP035013A	GSP3-1	77.5	CYCLOTETRAKSILOXANE, OCTAMETHYL-	6	NJ	R	PPBV	T		
4VP035013A	GSP3-1	77.5	DECANE	25	NJ	NJ	PPBV	T		
4VP035013A	GSP3-1	77.5	Dichlorodifluoromethane	2000	D		PPBV	F	JGJ-070-05	
4VP035013A	GSP3-1	77.5	Dichlortetrafluoroethane	10			PPBV	F	JGJ-070-05	
4VP035013A	GSP3-1	77.5	DODECANE	13	NJ	NJ	PPBV	T		
4VP035013A	GSP3-1	77.5	ETHANE, 1,2-DICHLORO-1,1,2-TRIFLUORO-	26	NJ	NJ	PPBV	T		
4VP035013A	GSP3-1	77.5	ETHANE, 1-CHLORO-1,1-DIFLUORO-	31	NJ	NJ	PPBV	T		
4VP035013A	GSP3-1	77.5	ETHENE, CHLOROTRIFLUORO-	54	NJ	NJ	PPBV	T		
4VP035013A	GSP3-1	77.5	Ethylbenzene	1.8			PPBV	F	JGJ-070-05	
4VP035013A	GSP3-1	77.5	Hexachlorobutadiene	1.2	U		PPBV	F	JGJ-070-05	
4VP035013A	GSP3-1	77.5	ISOBUTANE	96	NJ	NJ	PPBV	T		
4VP035013A	GSP3-1	77.5	m,p-Xylenes	5.9			PPBV	F	JGJ-070-05	
4VP035013A	GSP3-1	77.5	Methane	7.69		U	PPMV	F	DMG-195-05	
4VP035013A	GSP3-1	77.5	METHANE, CHLORODIFLUORO-	20	NJ	NJ	PPBV	T		
4VP035013A	GSP3-1	77.5	METHANE, DICHLOROFUORO-	110	NJ	NJ	PPBV	T		
4VP035013A	GSP3-1	77.5	Methylene Chloride	24			PPBV	F	JGJ-070-05	

Table A-3. (continued).

Field Sample	Number	Location	Depth	Compound	Sample Result	Result Qualifier	Validation Flag	Sample Units	Organic TIC	L&V Report Number
4VP035013A	GSP3-1	77.5		o-Xylene	1.8			PPBV	F	JGJ-070-05
4VP035013A	GSP3-1	77.5		PENTANE	30	NJ	NJ	PPBV	T	
4VP035013A	GSP3-1	77.5		PENTANE, 3-METHYL-	6.1	NJ	NJ	PPBV	T	
4VP035013A	GSP3-1	77.5		PROPANE, 2-CHLORO-2-METHYL-	4.2	NJ	NJ	PPBV	T	
4VP035013A	GSP3-1	77.5		SILANE, DIFLUORODIMETHYL-	9.7	NJ	NJ	PPBV	T	
4VP035013A	GSP3-1	77.5		Styrene	1.2	U		PPBV	F	JGJ-070-05
4VP035013A	GSP3-1	77.5		Tetrachloroethene	20			PPBV	F	JGJ-070-05
4VP035013A	GSP3-1	77.5		Toluene	8.4		U	PPBV	F	JGJ-070-05
4VP035013A	GSP3-1	77.5		trans-1,2-Dichloroethene	1.2	U		PPBV	F	JGJ-070-05
4VP035013A	GSP3-1	77.5		trans-1,3-Dichloropropene	1.2	U		PPBV	F	JGJ-070-05
4VP035013A	GSP3-1	77.5		Trichloroethene	98			PPBV	F	JGJ-070-05
4VP035013A	GSP3-1	77.5		Trichlorofluoromethane	2800	D		PPBV	F	JGJ-070-05
4VP035013A	GSP3-1	77.5		UNDECANE	43	NJ	NJ	PPBV	T	
4VP035013A	GSP3-1	77.5		Vinyl Chloride	1.6			PPBV	F	JGJ-070-05
4VP036013A	GSP3-1	107.5		1,1,1-Trichloroethane	18			PPBV	F	JGJ-070-05
4VP036013A	GSP3-1	107.5		1,1,2,2-Tetrachloroethane	1.3	U		PPBV	F	JGJ-070-05
4VP036013A	GSP3-1	107.5		1,1,2-Trichloroethane	1.3	U		PPBV	F	JGJ-070-05
4VP036013A	GSP3-1	107.5		1,1,2-Trichlorotrifluoroethane	6.6			PPBV	F	JGJ-070-05
4VP036013A	GSP3-1	107.5		1,1-Dichloroethane	2.5			PPBV	F	JGJ-070-05
4VP036013A	GSP3-1	107.5		1,1-Dichloroethene	6.9			PPBV	F	JGJ-070-05
4VP036013A	GSP3-1	107.5		1,2,4-Trichlorobenzene	1.4	U		PPBV	F	JGJ-070-05
4VP036013A	GSP3-1	107.5		1,2,4-Trimethylbenzene	1.3	U		PPBV	F	JGJ-070-05
4VP036013A	GSP3-1	107.5		1,2-Dibromoethane	1.3	U		PPBV	F	JGJ-070-05
4VP036013A	GSP3-1	107.5		1,2-Dichlorobenzene	1.3	U		PPBV	F	JGJ-070-05
4VP036013A	GSP3-1	107.5		1,2-Dichloroethane	1.3	U		PPBV	F	JGJ-070-05
4VP036013A	GSP3-1	107.5		1,2-Dichloropropane	1.3	U		PPBV	F	JGJ-070-05
4VP036013A	GSP3-1	107.5		1,3,5-Trimethylbenzene	1.3	U		PPBV	F	JGJ-070-05
4VP036013A	GSP3-1	107.5		1,3-Dichlorobenzene	1.3	U		PPBV	F	JGJ-070-05
4VP036013A	GSP3-1	107.5		1,4-Dichlorobenzene	1.3	U		PPBV	F	JGJ-070-05
4VP036013A	GSP3-1	107.5		2-Butanone	1.3	U		PPBV	F	JGJ-070-05
4VP036013A	GSP3-1	107.5		2-Hexanone	1.1	U		PPBV	F	JGJ-070-05
4VP036013A	GSP3-1	107.5		4-Ethyltoluene	1.3	U		PPBV	F	JGJ-070-05
4VP036013A	GSP3-1	107.5		4-Methyl-2-pentanone	1.3	U		PPBV	F	JGJ-070-05
4VP036013A	GSP3-1	107.5		Acetone	5		U	PPBV	F	JGJ-070-05
4VP036013A	GSP3-1	107.5		Benzene	1.3	U		PPBV	F	JGJ-070-05
4VP036013A	GSP3-1	107.5		Benzyl chloride	1.3	U		PPBV	F	JGJ-070-05
4VP036013A	GSP3-1	107.5		Bromomethane	1.2	U		PPBV	F	JGJ-070-05
4VP036013A	GSP3-1	107.5		Carbon disulfide	1.3	U		PPBV	F	JGJ-070-05
4VP036013A	GSP3-1	107.5		Carbon tetrachloride	1.3	U		PPBV	F	JGJ-070-05
4VP036013A	GSP3-1	107.5		Chlorobenzene	1.3	U		PPBV	F	JGJ-070-05
4VP036013A	GSP3-1	107.5		Chloroethane	1.2	U		PPBV	F	JGJ-070-05
4VP036013A	GSP3-1	107.5		Chloroform	1.3	U		PPBV	F	JGJ-070-05
4VP036013A	GSP3-1	107.5		Chloromethane	1.3	U		PPBV	F	JGJ-070-05
4VP036013A	GSP3-1	107.5		cis-1,2-Dichloroethene	1.3	U		PPBV	F	JGJ-070-05
4VP036013A	GSP3-1	107.5		cis-1,3-Dichloropropene	1.3	U		PPBV	F	JGJ-070-05
4VP036013A	GSP3-1	107.5		CYCLOTETRASILOXANE, OCTAMETHYL-	2.7	NJ	R	PPBV	T	
4VP036013A	GSP3-1	107.5		CYCLOTRISILOXANE, HEXAMETHYL-	1.3	NJ	R	PPBV	T	
4VP036013A	GSP3-1	107.5		Dichlorodifluoromethane	8.8			PPBV	F	JGJ-070-05
4VP036013A	GSP3-1	107.5		Dichlortetrafluoroethane	1.4	U		PPBV	F	JGJ-070-05
4VP036013A	GSP3-1	107.5		ETHANE, 1-CHLORO-1,1-DIFLUORO-	1.5	NJ	NJ	PPBV	T	
4VP036013A	GSP3-1	107.5		Ethylbenzene	1.3	U		PPBV	F	JGJ-070-05
4VP036013A	GSP3-1	107.5		Hexachlorobutadiene	1.3	U		PPBV	F	JGJ-070-05
4VP036013A	GSP3-1	107.5		ISOBUTANE	4.3	NJ	NJ	PPBV	T	
4VP036013A	GSP3-1	107.5		ISOPROPYL ALCOHOL	14	NJ	NJ	PPBV	T	
4VP036013A	GSP3-1	107.5		m,p-Xylenes	2.6	U		PPBV	F	JGJ-070-05
4VP036013A	GSP3-1	107.5		Methane	2.21		U	PPMV	F	DMG-195-05
4VP036013A	GSP3-1	107.5		METHANE, DICHLOROFLUORO-	1.6	NJ	NJ	PPBV	T	
4VP036013A	GSP3-1	107.5		Methylene Chloride	1.3	U		PPBV	F	JGJ-070-05
4VP036013A	GSP3-1	107.5		o-Xylene	1.3	U		PPBV	F	JGJ-070-05
4VP036013A	GSP3-1	107.5		Styrene	1.3	U		PPBV	F	JGJ-070-05
4VP036013A	GSP3-1	107.5		Tetrachloroethene	1.3	U		PPBV	F	JGJ-070-05
4VP036013A	GSP3-1	107.5		Toluene	1.3	U		PPBV	F	JGJ-070-05
4VP036013A	GSP3-1	107.5		trans-1,2-Dichloroethene	1.4	U		PPBV	F	JGJ-070-05
4VP036013A	GSP3-1	107.5		trans-1,3-Dichloropropene	1.3	U		PPBV	F	JGJ-070-05
4VP036013A	GSP3-1	107.5		Trichloroethene	1.3	U		PPBV	F	JGJ-070-05
4VP036013A	GSP3-1	107.5		Trichlorofluoromethane	11			PPBV	F	JGJ-070-05
4VP036013A	GSP3-1	107.5		UNKNOWN1	2	J	J	PPBV	T	
4VP036013A	GSP3-1	107.5		Vinyl Chloride	1.3	U		PPBV	F	JGJ-070-05
4VP037013A	GSP3-2	12.5		1,1,1-Trichloroethane	90			PPBV	F	JGJ-070-05
4VP037013A	GSP3-2	12.5		1,1,2,2-Tetrachloroethane	1.3	U		PPBV	F	JGJ-070-05
4VP037013A	GSP3-2	12.5		1,1,2-Trichloroethane	1.3	U		PPBV	F	JGJ-070-05
4VP037013A	GSP3-2	12.5		1,1,2-Trichlorotrifluoroethane	66			PPBV	F	JGJ-070-05
4VP037013A	GSP3-2	12.5		1,1-Dichloroethane	13			PPBV	F	JGJ-070-05
4VP037013A	GSP3-2	12.5		1,1-Dichloroethene	8.9			PPBV	F	JGJ-070-05
4VP037013A	GSP3-2	12.5		1,2,4-Trichlorobenzene	1.3	U		PPBV	F	JGJ-070-05
4VP037013A	GSP3-2	12.5		1,2,4-Trimethylbenzene	1.3	U		PPBV	F	JGJ-070-05
4VP037013A	GSP3-2	12.5		1,2-Dibromoethane	1.3	U		PPBV	F	JGJ-070-05

Table A-3. (continued).

Field Sample	Sample Result	Result Qualifier	Validation Flag	Sample Units	Organic TIC	L&V Report Number	
Number	Location	Depth	Compound				
4VP037013A	GSP3-2	12.5	1,2-Dichlorobenzene	1.3	U	PPBV F JGJ-070-05	
4VP037013A	GSP3-2	12.5	1,2-Dichloroethane	1.3	U	PPBV F JGJ-070-05	
4VP037013A	GSP3-2	12.5	1,2-Dichloropropane	1.3	U	PPBV F JGJ-070-05	
4VP037013A	GSP3-2	12.5	1,3,5-Trimethylbenzene	1.3	U	PPBV F JGJ-070-05	
4VP037013A	GSP3-2	12.5	1,3-Dichlorobenzene	1.3	U	PPBV F JGJ-070-05	
4VP037013A	GSP3-2	12.5	1,4-Dichlorobenzene	1.3	U	PPBV F JGJ-070-05	
4VP037013A	GSP3-2	12.5	1-PENTENE, 2,4,4-TRIMETHYL-	5.9	NJ	PPBV T	
4VP037013A	GSP3-2	12.5	2-Butanone	1.3	U	PPBV F JGJ-070-05	
4VP037013A	GSP3-2	12.5	2-Hexanone	1.1	U	PPBV F JGJ-070-05	
4VP037013A	GSP3-2	12.5	4-Ethyltoluene	1.3	U	PPBV F JGJ-070-05	
4VP037013A	GSP3-2	12.5	4-Methyl-2-pentanone	1.3	U	PPBV F JGJ-070-05	
4VP037013A	GSP3-2	12.5	ACETIC ACID, CHLOROFLUORO-, ETHYL	3.4	NJ	PPBV T	
4VP037013A	GSP3-2	12.5	Acetone	3.9	U	PPBV F JGJ-070-05	
4VP037013A	GSP3-2	12.5	Benzene	1.3	U	PPBV F JGJ-070-05	
4VP037013A	GSP3-2	12.5	Benzyl chloride	1.3	U	PPBV F JGJ-070-05	
4VP037013A	GSP3-2	12.5	Bromomethane	1.1	U	PPBV F JGJ-070-05	
4VP037013A	GSP3-2	12.5	Carbon disulfide	1.3	U	PPBV F JGJ-070-05	
4VP037013A	GSP3-2	12.5	Carbon tetrachloride	1.3	U	PPBV F JGJ-070-05	
4VP037013A	GSP3-2	12.5	Chlorobenzene	1.3	U	PPBV F JGJ-070-05	
4VP037013A	GSP3-2	12.5	Chloroethane	1.2	U	PPBV F JGJ-070-05	
4VP037013A	GSP3-2	12.5	Chloroform	2.6	U	PPBV F JGJ-070-05	
4VP037013A	GSP3-2	12.5	Chloromethane	1.3	U	PPBV F JGJ-070-05	
4VP037013A	GSP3-2	12.5	cis-1,2-Dichloroethene	5.1	U	PPBV F JGJ-070-05	
4VP037013A	GSP3-2	12.5	cis-1,3-Dichloropropene	1.3	U	PPBV F JGJ-070-05	
4VP037013A	GSP3-2	12.5	CYCLOTETRASILOXANE, OCTAMETHYL-	3.1	NJ	R	PPBV T
4VP037013A	GSP3-2	12.5	Dichlorodifluoromethane	49	U	PPBV F JGJ-070-05	
4VP037013A	GSP3-2	12.5	Dichlortetrafluoroethane	1.3	U	PPBV F JGJ-070-05	
4VP037013A	GSP3-2	12.5	ETHANE, 1,2-DICHLORO-1,1,2-TRIFLUORO-	6.1	NJ	NJ	PPBV T
4VP037013A	GSP3-2	12.5	ETHANE, 1-CHLORO-1,1-DIFLUORO-	3.6	NJ	NJ	PPBV T
4VP037013A	GSP3-2	12.5	ETHENE, CHLOROTRIFLUORO-	4.2	NJ	NJ	PPBV T
4VP037013A	GSP3-2	12.5	Ethylbenzene	1.3	U	PPBV F JGJ-070-05	
4VP037013A	GSP3-2	12.5	Hexachlorobutadiene	1.3	U	PPBV F JGJ-070-05	
4VP037013A	GSP3-2	12.5	m,p-Xylenes	2.5	U	PPBV F JGJ-070-05	
4VP037013A	GSP3-2	12.5	Methane	1.99	U	PPMV F DMG-195-05	
4VP037013A	GSP3-2	12.5	METHANE, DICHLOROFLUORO-	1.5	NJ	NJ	PPBV T
4VP037013A	GSP3-2	12.5	Methylene Chloride	1.3	U	PPBV F JGJ-070-05	
4VP037013A	GSP3-2	12.5	o-Xylene	1.3	U	PPBV F JGJ-070-05	
4VP037013A	GSP3-2	12.5	Styrene	1.3	U	PPBV F JGJ-070-05	
4VP037013A	GSP3-2	12.5	Tetrachloroethene	34	U	PPBV F JGJ-070-05	
4VP037013A	GSP3-2	12.5	Toluene	1.3	U	PPBV F JGJ-070-05	
4VP037013A	GSP3-2	12.5	trans-1,2-Dichloroethene	1.3	U	PPBV F JGJ-070-05	
4VP037013A	GSP3-2	12.5	trans-1,3-Dichloropropene	1.3	U	PPBV F JGJ-070-05	
4VP037013A	GSP3-2	12.5	Trichloroethene	61	U	PPBV F JGJ-070-05	
4VP037013A	GSP3-2	12.5	Trichlorofluoromethane	33	U	PPBV F JGJ-070-05	
4VP037013A	GSP3-2	12.5	UNKNOWN1	6.3	J	J	PPBV T
4VP037013A	GSP3-2	12.5	Vinyl Chloride	1.3	U	PPBV F JGJ-070-05	
4VP038013A	GSP3-2	37.5	1,1,1-Trichloroethane	530	U	PPBV F JGJ-070-05	
4VP038013A	GSP3-2	37.5	1,1,2,2-Tetrachloroethane	15	U	PPBV F JGJ-070-05	
4VP038013A	GSP3-2	37.5	1,1,2-Trichloroethane	15	U	PPBV F JGJ-070-05	
4VP038013A	GSP3-2	37.5	1,1,2-Trichlorotrifluoroethane	500	U	PPBV F JGJ-070-05	
4VP038013A	GSP3-2	37.5	1,1-Dichloroethane	150	U	PPBV F JGJ-070-05	
4VP038013A	GSP3-2	37.5	1,1-Dichloroethene	16	U	PPBV F JGJ-070-05	
4VP038013A	GSP3-2	37.5	1,2,4-Trichlorobenzene	16	U	PPBV F JGJ-070-05	
4VP038013A	GSP3-2	37.5	1,2,4-Trimethylbenzene	15	U	PPBV F JGJ-070-05	
4VP038013A	GSP3-2	37.5	1,2-Dibromoethane	15	U	PPBV F JGJ-070-05	
4VP038013A	GSP3-2	37.5	1,2-Dichlorobenzene	15	U	PPBV F JGJ-070-05	
4VP038013A	GSP3-2	37.5	1,2-Dichloroethane	15	U	PPBV F JGJ-070-05	
4VP038013A	GSP3-2	37.5	1,2-Dichloropropane	15	U	PPBV F JGJ-070-05	
4VP038013A	GSP3-2	37.5	1,3,5-Trimethylbenzene	15	U	PPBV F JGJ-070-05	
4VP038013A	GSP3-2	37.5	1,3-Dichlorobenzene	15	U	PPBV F JGJ-070-05	
4VP038013A	GSP3-2	37.5	1,4-Dichlorobenzene	15	U	PPBV F JGJ-070-05	
4VP038013A	GSP3-2	37.5	2-Butanone	15	U	PPBV F JGJ-070-05	
4VP038013A	GSP3-2	37.5	2-Hexanone	13	U	PPBV F JGJ-070-05	
4VP038013A	GSP3-2	37.5	4-Ethyltoluene	15	U	PPBV F JGJ-070-05	
4VP038013A	GSP3-2	37.5	4-Methyl-2-pentanone	15	U	PPBV F JGJ-070-05	
4VP038013A	GSP3-2	37.5	ACETIC ACID, CHLOROFLUORO-, ETHYL	57	NJ	NJ	PPBV T
4VP038013A	GSP3-2	37.5	Acetone	15	U	PPBV F JGJ-070-05	
4VP038013A	GSP3-2	37.5	Benzene	15	U	PPBV F JGJ-070-05	
4VP038013A	GSP3-2	37.5	Benzyl chloride	15	U	PPBV F JGJ-070-05	
4VP038013A	GSP3-2	37.5	Bromomethane	14	U	PPBV F JGJ-070-05	
4VP038013A	GSP3-2	37.5	Carbon disulfide	15	U	PPBV F JGJ-070-05	
4VP038013A	GSP3-2	37.5	Carbon tetrachloride	15	U	PPBV F JGJ-070-05	
4VP038013A	GSP3-2	37.5	Chlorobenzene	15	U	PPBV F JGJ-070-05	
4VP038013A	GSP3-2	37.5	Chloroethane	14	U	PPBV F JGJ-070-05	
4VP038013A	GSP3-2	37.5	Chloroform	15	U	PPBV F JGJ-070-05	
4VP038013A	GSP3-2	37.5	Chloromethane	15	U	PPBV F JGJ-070-05	
4VP038013A	GSP3-2	37.5	cis-1,2-Dichloroethene	29	U	PPBV F JGJ-070-05	

Table A-3. (continued).

Field Sample Number	Location	Depth	Compound	Sample Result	Result Qualifier	Validation Flag	Sample Units	Organic TIC	L&V Report Number
4VP038013A	GSP3-2	37.5	cis-1,3-Dichloropropene	15	U		PPBV	F	JGJ-070-05
4VP038013A	GSP3-2	37.5	CYCLOTETRASILOXANE, OCTAMETHYL-	130	NJ	R	PPBV	T	
4VP038013A	GSP3-2	37.5	CYCLOTRILOXANE, HEXAMETHYL-	16	NJ	R	PPBV	T	
4VP038013A	GSP3-2	37.5	Dichlorodifluoromethane	540			PPBV	F	JGJ-070-05
4VP038013A	GSP3-2	37.5	Dichlorotetrafluoroethane	16	U		PPBV	F	JGJ-070-05
4VP038013A	GSP3-2	37.5	ETHANE, 1,2-DICHLORO-1,1,2-TRIFLUORO-	51	NJ	NJ	PPBV	T	
4VP038013A	GSP3-2	37.5	ETHANE, 1-CHLORO-1,1-DIFLUORO-	70	NJ	NJ	PPBV	T	
4VP038013A	GSP3-2	37.5	ETHENE, CHLOROTRIFLUORO-	49	NJ	NJ	PPBV	T	
4VP038013A	GSP3-2	37.5	Ethylbenzene	15	U		PPBV	F	JGJ-070-05
4VP038013A	GSP3-2	37.5	Hexachlorobutadiene	15	U		PPBV	F	JGJ-070-05
4VP038013A	GSP3-2	37.5	m,p-Xylenes	30	U		PPBV	F	JGJ-070-05
4VP038013A	GSP3-2	37.5	Methane	5.87		U	PPMV	F	DMG-195-05
4VP038013A	GSP3-2	37.5	METHANE, DICHLOROFLUORO-	44	NJ	NJ	PPBV	T	
4VP038013A	GSP3-2	37.5	Methylene Chloride	15	U		PPBV	F	JGJ-070-05
4VP038013A	GSP3-2	37.5	o-Xylene	15	U		PPBV	F	JGJ-070-05
4VP038013A	GSP3-2	37.5	Styrene	15	U		PPBV	F	JGJ-070-05
4VP038013A	GSP3-2	37.5	Tetrachloroethene	130			PPBV	F	JGJ-070-05
4VP038013A	GSP3-2	37.5	Toluene	15	U		PPBV	F	JGJ-070-05
4VP038013A	GSP3-2	37.5	trans-1,2-Dichloroethene	16	U		PPBV	F	JGJ-070-05
4VP038013A	GSP3-2	37.5	trans-1,3-Dichloropropene	15	U		PPBV	F	JGJ-070-05
4VP038013A	GSP3-2	37.5	Trichloroethene	140			PPBV	F	JGJ-070-05
4VP038013A	GSP3-2	37.5	Trichlorofluoromethane	450			PPBV	F	JGJ-070-05
4VP038013A	GSP3-2	37.5	UNKNOWN1	78	J	J	PPBV	T	
4VP038013A	GSP3-2	37.5	Vinyl Chloride	15	U		PPBV	F	JGJ-070-05
4VP039013A	GSP3-2	77.5	1,1,1-Trichloroethane	15			PPBV	F	JGJ-070-05
4VP039013A	GSP3-2	77.5	1,1,2,2-Tetrachloroethane	1.3	U		PPBV	F	JGJ-070-05
4VP039013A	GSP3-2	77.5	1,1,2-Trichloroethane	1.3	U		PPBV	F	JGJ-070-05
4VP039013A	GSP3-2	77.5	1,1,2-Trichlorotrifluoroethane	2.5			PPBV	F	JGJ-070-05
4VP039013A	GSP3-2	77.5	1,1-Dichloroethane	1.3			PPBV	F	JGJ-070-05
4VP039013A	GSP3-2	77.5	1,1-Dichloroethene	3			PPBV	F	JGJ-070-05
4VP039013A	GSP3-2	77.5	1,2,4-Trichlorobenzene	1.4	U		PPBV	F	JGJ-070-05
4VP039013A	GSP3-2	77.5	1,2,4-Trimethylbenzene	1.3	U		PPBV	F	JGJ-070-05
4VP039013A	GSP3-2	77.5	1,2-Dibromoethane	1.3	U		PPBV	F	JGJ-070-05
4VP039013A	GSP3-2	77.5	1,2-Dichlorobenzene	1.3	U		PPBV	F	JGJ-070-05
4VP039013A	GSP3-2	77.5	1,2-Dichloroethane	1.3	U		PPBV	F	JGJ-070-05
4VP039013A	GSP3-2	77.5	1,2-Dichloropropane	1.3	U		PPBV	F	JGJ-070-05
4VP039013A	GSP3-2	77.5	1,3,5-Trimethylbenzene	1.3	U		PPBV	F	JGJ-070-05
4VP039013A	GSP3-2	77.5	1,3-Dichlorobenzene	1.3	U		PPBV	F	JGJ-070-05
4VP039013A	GSP3-2	77.5	1,4-Dichlorobenzene	1.3	U		PPBV	F	JGJ-070-05
4VP039013A	GSP3-2	77.5	1-NONENE	2.7	NJ	NJ	PPBV	T	
4VP039013A	GSP3-2	77.5	2-Butanone	1.3	U		PPBV	F	JGJ-070-05
4VP039013A	GSP3-2	77.5	2-Hexanone	1.1	U		PPBV	F	JGJ-070-05
4VP039013A	GSP3-2	77.5	4-Ethyltoluene	1.3	U		PPBV	F	JGJ-070-05
4VP039013A	GSP3-2	77.5	4-Methyl-2-pentanone	1.3	U		PPBV	F	JGJ-070-05
4VP039013A	GSP3-2	77.5	Acetone	5.7		U	PPBV	F	JGJ-070-05
4VP039013A	GSP3-2	77.5	Benzene	1.3	U		PPBV	F	JGJ-070-05
4VP039013A	GSP3-2	77.5	Benzyl chloride	1.3	U		PPBV	F	JGJ-070-05
4VP039013A	GSP3-2	77.5	Bromomethane	1.2	U		PPBV	F	JGJ-070-05
4VP039013A	GSP3-2	77.5	BUTANE, 2-METHYL-	5.2	NJ	NJ	PPBV	T	
4VP039013A	GSP3-2	77.5	Carbon disulfide	1.3	U		PPBV	F	JGJ-070-05
4VP039013A	GSP3-2	77.5	Carbon tetrachloride	1.3	U		PPBV	F	JGJ-070-05
4VP039013A	GSP3-2	77.5	Chlorobenzene	1.3	U		PPBV	F	JGJ-070-05
4VP039013A	GSP3-2	77.5	Chloroethane	1.2	U		PPBV	F	JGJ-070-05
4VP039013A	GSP3-2	77.5	Chloroform	1.3	U		PPBV	F	JGJ-070-05
4VP039013A	GSP3-2	77.5	Chloromethane	1.3	U		PPBV	F	JGJ-070-05
4VP039013A	GSP3-2	77.5	cis-1,2-Dichloroethene	1.3	U		PPBV	F	JGJ-070-05
4VP039013A	GSP3-2	77.5	cis-1,3-Dichloropropene	1.3	U		PPBV	F	JGJ-070-05
4VP039013A	GSP3-2	77.5	CYCLOTETRASILOXANE, OCTAMETHYL-	9.4	NJ	R	PPBV	T	
4VP039013A	GSP3-2	77.5	CYCLOTRILOXANE, HEXAMETHYL-	1.6	NJ	R	PPBV	T	
4VP039013A	GSP3-2	77.5	Dichlorodifluoromethane	1.6			PPBV	F	JGJ-070-05
4VP039013A	GSP3-2	77.5	Dichlortetrafluoroethane	1.4	U		PPBV	F	JGJ-070-05
4VP039013A	GSP3-2	77.5	Ethylbenzene	1.3	U		PPBV	F	JGJ-070-05
4VP039013A	GSP3-2	77.5	Hexachlorobutadiene	1.3	U		PPBV	F	JGJ-070-05
4VP039013A	GSP3-2	77.5	ISOBUTANE	5.6	NJ	NJ	PPBV	T	
4VP039013A	GSP3-2	77.5	m,p-Xylenes	2.6	U		PPBV	F	JGJ-070-05
4VP039013A	GSP3-2	77.5	Methane	2.11		U	PPMV	F	DMG-195-05
4VP039013A	GSP3-2	77.5	Methylene Chloride	1.3	U		PPBV	F	JGJ-070-05
4VP039013A	GSP3-2	77.5	o-Xylene	1.3	U		PPBV	F	JGJ-070-05
4VP039013A	GSP3-2	77.5	Styrene	1.3	U		PPBV	F	JGJ-070-05
4VP039013A	GSP3-2	77.5	Tetrachloroethene	7.8			PPBV	F	JGJ-070-05
4VP039013A	GSP3-2	77.5	Toluene	1.3	U		PPBV	F	JGJ-070-05
4VP039013A	GSP3-2	77.5	trans-1,2-Dichloroethene	1.4	U		PPBV	F	JGJ-070-05
4VP039013A	GSP3-2	77.5	trans-1,3-Dichloropropene	1.3	U		PPBV	F	JGJ-070-05
4VP039013A	GSP3-2	77.5	Trichloroethene	6.6			PPBV	F	JGJ-070-05
4VP039013A	GSP3-2	77.5	Trichlorofluoromethane	3.1			PPBV	F	JGJ-070-05
4VP039013A	GSP3-2	77.5	Vinyl Chloride	1.3	U		PPBV	F	JGJ-070-05
4VP039013A	GSP3-2	107.5	1,1,1-Trichloroethane	4700	D		PPBV	F	JGJ-069-05

Table A-3. (continued).

Field Sample	Number	Location	Depth	Compound	Sample Result	Result Qualifier	Validation Flag	Sample Units	Organic TIC	L&V Report Number
4VP040013A	GSP3-2	107.5		1,1,2,2-Tetrachloroethane	1.3	U		PPBV	F	JGJ-069-05
4VP040013A	GSP3-2	107.5		1,1,2-Trichloroethane	1.3	U		PPBV	F	JGJ-069-05
4VP040013A	GSP3-2	107.5		1,1,2-Trichlorotrifluoroethane	2800	D		PPBV	F	JGJ-069-05
4VP040013A	GSP3-2	107.5		1,1-Dichloroethane	860	D		PPBV	F	JGJ-069-05
4VP040013A	GSP3-2	107.5		1,1-Dichloroethene	960	D		PPBV	F	JGJ-069-05
4VP040013A	GSP3-2	107.5		1,2,4-Trichlorobenzene	1.4	U		PPBV	F	JGJ-069-05
4VP040013A	GSP3-2	107.5		1,2,4-Trimethylbenzene	1.3	U		PPBV	F	JGJ-069-05
4VP040013A	GSP3-2	107.5		1,2-Dibromoethane	1.3	U		PPBV	F	JGJ-069-05
4VP040013A	GSP3-2	107.5		1,2-Dichlorobenzene	1.3	U		PPBV	F	JGJ-069-05
4VP040013A	GSP3-2	107.5		1,2-Dichloroethane	1.3	U		PPBV	F	JGJ-069-05
4VP040013A	GSP3-2	107.5		1,2-Dichloropropane	1.3	U		PPBV	F	JGJ-069-05
4VP040013A	GSP3-2	107.5		1,3,5-Trimethylbenzene	1.3	U		PPBV	F	JGJ-069-05
4VP040013A	GSP3-2	107.5		1,3-Dichlorobenzene	1.3	U		PPBV	F	JGJ-069-05
4VP040013A	GSP3-2	107.5		1,4-Dichlorobenzene	1.3	U		PPBV	F	JGJ-069-05
4VP040013A	GSP3-2	107.5		1-BUTENE	9.1	NJ	NJ	PPBV	T	
4VP040013A	GSP3-2	107.5		1-BUTENE, 2-METHYL-	4.2	J	J	PPBV	T	
4VP040013A	GSP3-2	107.5		1-PROPENE, 2-METHYL-	24	NJ	NJ	PPBV	T	
4VP040013A	GSP3-2	107.5		2-Butanone	1.3	U		PPBV	F	JGJ-069-05
4VP040013A	GSP3-2	107.5		2-BUTENE, 2-METHYL-	16	J	J	PPBV	T	
4VP040013A	GSP3-2	107.5		2-Hexanone	1.1	U		PPBV	F	JGJ-069-05
4VP040013A	GSP3-2	107.5		2-PENTANE, (Z)-	7	J	J	PPBV	T	
4VP040013A	GSP3-2	107.5		4-Ethyltoluene	1.3	U		PPBV	F	JGJ-069-05
4VP040013A	GSP3-2	107.5		4-Methyl-2-pentanone	1.3	U		PPBV	F	JGJ-069-05
4VP040013A	GSP3-2	107.5		Acetone	4		U	PPBV	F	JGJ-069-05
4VP040013A	GSP3-2	107.5		Benzene	1.3	U		PPBV	F	JGJ-069-05
4VP040013A	GSP3-2	107.5		Benzyl chloride	1.3	U		PPBV	F	JGJ-069-05
4VP040013A	GSP3-2	107.5		Bromomethane	2.1			PPBV	F	JGJ-069-05
4VP040013A	GSP3-2	107.5		BUTANE	49	NJ	NJ	PPBV	T	
4VP040013A	GSP3-2	107.5		BUTANE, 2,2-DIMETHYL-	14	NJ	NJ	PPBV	T	
4VP040013A	GSP3-2	107.5		BUTANE, 2-METHYL-	23	NJ	NJ	PPBV	T	
4VP040013A	GSP3-2	107.5		Carbon disulfide	1.3	U		PPBV	F	JGJ-069-05
4VP040013A	GSP3-2	107.5		Carbon tetrachloride	1.5			PPBV	F	JGJ-069-05
4VP040013A	GSP3-2	107.5		Chlorobenzene	1.3	U		PPBV	F	JGJ-069-05
4VP040013A	GSP3-2	107.5		Chloroethane	1.2	U		PPBV	F	JGJ-069-05
4VP040013A	GSP3-2	107.5		Chloroform	9.2			PPBV	F	JGJ-069-05
4VP040013A	GSP3-2	107.5		Chloromethane	1.3	U		PPBV	F	JGJ-069-05
4VP040013A	GSP3-2	107.5		cis-1,2-Dichloroethene	110			PPBV	F	JGJ-069-05
4VP040013A	GSP3-2	107.5		cis-1,3-Dichloropropene	1.3	U		PPBV	F	JGJ-069-05
4VP040013A	GSP3-2	107.5		CYCLOHEXANE	5.1	NJ	NJ	PPBV	T	
4VP040013A	GSP3-2	107.5		CYCLOTETRA SILOXANE, OCTAMETHYL-	10	NJ	R	PPBV	T	
4VP040013A	GSP3-2	107.5		Dichlorodifluoromethane	330	E		PPBV	F	JGJ-069-05
4VP040013A	GSP3-2	107.5		Dichlortetrafluoroethane	41			PPBV	F	JGJ-069-05
4VP040013A	GSP3-2	107.5		ETHANE, 1,1-DIFLUORO-	2.6	NJ	NJ	PPBV	T	
4VP040013A	GSP3-2	107.5		ETHANE, 1,2-DICHLORO-1, 1,2-TRIFLUORO-	57	NJ	NJ	PPBV	T	
4VP040013A	GSP3-2	107.5		ETHANE, 1-CHLORO-1, 1-DIFLUORO-	160	NJ	NJ	PPBV	T	
4VP040013A	GSP3-2	107.5		ETHENE, CHLOROTRIFLUORO-	120	NJ	NJ	PPBV	T	
4VP040013A	GSP3-2	107.5		Ethylbenzene	1.3	U		PPBV	F	JGJ-069-05
4VP040013A	GSP3-2	107.5		Hexachlorobutadiene	1.3	U		PPBV	F	JGJ-069-05
4VP040013A	GSP3-2	107.5		ISOBUTANE	190	NJ	NJ	PPBV	T	
4VP040013A	GSP3-2	107.5		m,p-Xylenes	2.6	U		PPBV	F	JGJ-069-05
4VP040013A	GSP3-2	107.5		Methane	9.58		U	PPMV	F	DMG-195-05
4VP040013A	GSP3-2	107.5		METHANE, CHLORODIFLUORO-	63	NJ	NJ	PPBV	T	
4VP040013A	GSP3-2	107.5		METHANE, DICHLORODIFLUORO-	150	NJ	NJ	PPBV	T	
4VP040013A	GSP3-2	107.5		Methylene Chloride	1.4			PPBV	F	JGJ-069-05
4VP040013A	GSP3-2	107.5		o-Xylene	1.3	U		PPBV	F	JGJ-069-05
4VP040013A	GSP3-2	107.5		PENTANE	27	NJ	NJ	PPBV	T	
4VP040013A	GSP3-2	107.5		PENTANE, 3-METHYL-	3.5	NJ	NJ	PPBV	T	
4VP040013A	GSP3-2	107.5		Styrene	1.3	U		PPBV	F	JGJ-069-05
4VP040013A	GSP3-2	107.5		Tetrachloroethene	15			PPBV	F	JGJ-069-05
4VP040013A	GSP3-2	107.5		Toluene	1.3	U		PPBV	F	JGJ-069-05
4VP040013A	GSP3-2	107.5		trans-1,2-Dichloroethene	1.4	U		PPBV	F	JGJ-069-05
4VP040013A	GSP3-2	107.5		trans-1,3-Dichloropropene	1.3	U		PPBV	F	JGJ-069-05
4VP040013A	GSP3-2	107.5		Trichloroethene	120			PPBV	F	JGJ-069-05
4VP040013A	GSP3-2	107.5		Trichlorofluoromethane	6200	D		PPBV	F	JGJ-069-05
4VP040013A	GSP3-2	107.5		Vinyl Chloride	1.3	U		PPBV	F	JGJ-069-05
4VP041013A	CFA-1931	295-300		Dichlorodifluoromethane	420			PPB (V/V)	F	JGJ-069-05
4VP041013A	CFA-1931	295-300		Chloromethane	7.3	U		PPB (V/V)	F	JGJ-069-05
4VP041013A	CFA-1931	295-300		Dichlortetrafluoroethane	7.7	U		PPB (V/V)	F	JGJ-069-05
4VP041013A	CFA-1931	295-300		Vinyl Chloride	7.3	U		PPB (V/V)	F	JGJ-069-05
4VP041013A	CFA-1931	295-300		Bromomethane	6.6	U		PPB (V/V)	F	JGJ-069-05
4VP041013A	CFA-1931	295-300		Chloroethane	6.9	U		PPB (V/V)	F	JGJ-069-05
4VP041013A	CFA-1931	295-300		Acetone	25		J	PPB (V/V)	F	JGJ-069-05
4VP041013A	CFA-1931	295-300		Trichlorofluoromethane	170			PPB (V/V)	F	JGJ-069-05
4VP041013A	CFA-1931	295-300		1,1-Dichloroethene	14			PPB (V/V)	F	JGJ-069-05
4VP041013A	CFA-1931	295-300		Methylene Chloride	7.3	U		PPB (V/V)	F	JGJ-069-05
4VP041013A	CFA-1931	295-300		1,1,2-Trichlorotrifluoroethane	50			PPB (V/V)	F	JGJ-069-05
4VP041013A	CFA-1931	295-300		Carbon disulfide	10			PPB (V/V)	F	JGJ-069-05

Table A-3. (continued).

Field Sample	Number	Location	Depth	Compound	Sample Result	Result Qualifier	Validation Flag	Sample Units	Organic TIC	L&V Report Number
4VP041013A	CFA-1931	295-300		trans-1,2-Dichloroethene	7.7	U		PPB (V/V)	F	JGJ-069-05
4VP041013A	CFA-1931	295-300		1,1-Dichloroethane	67			PPB (V/V)	F	JGJ-069-05
4VP041013A	CFA-1931	295-300		2-Butanone	7.3	U		PPB (V/V)	F	JGJ-069-05
4VP041013A	CFA-1931	295-300		cis-1,2-Dichloroethene	7.3	U		PPB (V/V)	F	JGJ-069-05
4VP041013A	CFA-1931	295-300		Chloroform	38			PPB (V/V)	F	JGJ-069-05
4VP041013A	CFA-1931	295-300		1,2-Dichloroethane	7.3	U		PPB (V/V)	F	JGJ-069-05
4VP041013A	CFA-1931	295-300		1,1,1-Trichloroethane	96			PPB (V/V)	F	JGJ-069-05
4VP041013A	CFA-1931	295-300		Benzene	7.3	U		PPB (V/V)	F	JGJ-069-05
4VP041013A	CFA-1931	295-300		Carbon tetrachloride	24	U		PPB (V/V)	F	JGJ-069-05
4VP041013A	CFA-1931	295-300		1,2-Dichloropropane	7.3	U		PPB (V/V)	F	JGJ-069-05
4VP041013A	CFA-1931	295-300		Trichloroethene	39			PPB (V/V)	F	JGJ-069-05
4VP041013A	CFA-1931	295-300		4-Methyl-2-pentanone	7.3	U		PPB (V/V)	F	JGJ-069-05
4VP041013A	CFA-1931	295-300		cis-1,3-Dichloropropene	7.3	U		PPB (V/V)	F	JGJ-069-05
4VP041013A	CFA-1931	295-300		trans-1,3-Dichloropropene	7.3	U		PPB (V/V)	F	JGJ-069-05
4VP041013A	CFA-1931	295-300		1,1,2-Trichloroethane	7.3	U		PPB (V/V)	F	JGJ-069-05
4VP041013A	CFA-1931	295-300		Toluene	7.3	U		PPB (V/V)	F	JGJ-069-05
4VP041013A	CFA-1931	295-300		2-Hexanone	6.3	U		PPB (V/V)	F	JGJ-069-05
4VP041013A	CFA-1931	295-300		1,2-Dibromoethane	7.3	U		PPB (V/V)	F	JGJ-069-05
4VP041013A	CFA-1931	295-300		Tetrachloroethene	64			PPB (V/V)	F	JGJ-069-05
4VP041013A	CFA-1931	295-300		Chlorobenzene	7.3	U		PPB (V/V)	F	JGJ-069-05
4VP041013A	CFA-1931	295-300		Ethylbenzene	7.3	U		PPB (V/V)	F	JGJ-069-05
4VP041013A	CFA-1931	295-300		m,p-Xylenes	15	U		PPB (V/V)	F	JGJ-069-05
4VP041013A	CFA-1931	295-300		Styrene	7.3	U		PPB (V/V)	F	JGJ-069-05
4VP041013A	CFA-1931	295-300		1,1,2,2-Tetrachloroethane	7.3	U		PPB (V/V)	F	JGJ-069-05
4VP041013A	CFA-1931	295-300		o-Xylene	7.3	U		PPB (V/V)	F	JGJ-069-05
4VP041013A	CFA-1931	295-300		4-Ethyltoluene	7.3	U		PPB (V/V)	F	JGJ-069-05
4VP041013A	CFA-1931	295-300		1,3,5-Trimethylbenzene	7.3	U		PPB (V/V)	F	JGJ-069-05
4VP041013A	CFA-1931	295-300		1,2,4-Trimethylbenzene	7.3	U		PPB (V/V)	F	JGJ-069-05
4VP041013A	CFA-1931	295-300		Benzyl chloride	7.3	U		PPB (V/V)	F	JGJ-069-05
4VP041013A	CFA-1931	295-300		1,3-Dichlorobenzene	7.3	U		PPB (V/V)	F	JGJ-069-05
4VP041013A	CFA-1931	295-300		1,4-Dichlorobenzene	7.3	U		PPB (V/V)	F	JGJ-069-05
4VP041013A	CFA-1931	295-300		1,2-Dichlorobenzene	7.3	U		PPB (V/V)	F	JGJ-069-05
4VP041013A	CFA-1931	295-300		1,2,4-Trichlorobenzene	7.8	U		PPB (V/V)	F	JGJ-069-05
4VP041013A	CFA-1931	295-300		Hexachlorobutadiene	7.3	U		PPB (V/V)	F	JGJ-069-05
4VP041013A	CFA-1931	295-300		METHANE, CHLORODIFLUORO-	20	NJ	NJ	PPB (V/V)	T	
4VP041013A	CFA-1931	295-300		ETHENE, CHLOROTRIFLUORO-	16	NJ	NJ	PPB (V/V)	T	
4VP041013A	CFA-1931	295-300		ISOBUTANE	58	NJ	NJ	PPB (V/V)	T	
4VP041013A	CFA-1931	295-300		METHANE, DICHLOROFUORO-	28	NJ	NJ	PPB (V/V)	T	
4VP041013A	CFA-1931	295-300		ETHANE, 1,2-DICHLORO-1,1,2-TRIFLUORO-	12	NJ	NJ	PPB (V/V)	T	
4VP041013A	CFA-1931	295-300		UNKNOWN	16	J	J	PPB (V/V)	T	
4VP041013A	CFA-1931	295-300		CYCLOTETRASILOXANE, OCTAMETHYL-	26	NJ	R	PPB (V/V)	T	
4VP042013A	CFA-1931	470-475		Dichlorodifluoromethane	7	U		PPB (V/V)	F	JGJ-069-05
4VP042013A	CFA-1931	470-475		Chloromethane	6.5	U		PPB (V/V)	F	JGJ-069-05
4VP042013A	CFA-1931	470-475		Dichlorotetrafluoroethane	6.9	U		PPB (V/V)	F	JGJ-069-05
4VP042013A	CFA-1931	470-475		Vinyl Chloride	6.5	U		PPB (V/V)	F	JGJ-069-05
4VP042013A	CFA-1931	470-475		Bromomethane	5.9	U		PPB (V/V)	F	JGJ-069-05
4VP042013A	CFA-1931	470-475		Chloroethane	6.1	U		PPB (V/V)	F	JGJ-069-05
4VP042013A	CFA-1931	470-475		Acetone	90			PPB (V/V)	F	JGJ-069-05
4VP042013A	CFA-1931	470-475		Trichlorofluoromethane	6.5	U		PPB (V/V)	F	JGJ-069-05
4VP042013A	CFA-1931	470-475		1,1-Dichloroethene	7	U		PPB (V/V)	F	JGJ-069-05
4VP042013A	CFA-1931	470-475		Methylene Chloride	6.5	U		PPB (V/V)	F	JGJ-069-05
4VP042013A	CFA-1931	470-475		1,1,2-Trichlorotrifluoroethane	6.5	U		PPB (V/V)	F	JGJ-069-05
4VP042013A	CFA-1931	470-475		Carbon disulfide	6.5	U		PPB (V/V)	F	JGJ-069-05
4VP042013A	CFA-1931	470-475		trans-1,2-Dichloroethene	6.9	U		PPB (V/V)	F	JGJ-069-05
4VP042013A	CFA-1931	470-475		1,1-Dichloroethane	6.5	U		PPB (V/V)	F	JGJ-069-05
4VP042013A	CFA-1931	470-475		2-Butanone	6.5	U		PPB (V/V)	F	JGJ-069-05
4VP042013A	CFA-1931	470-475		cis-1,2-Dichloroethene	6.5	U		PPB (V/V)	F	JGJ-069-05
4VP042013A	CFA-1931	470-475		Chloroform	6.5	U		PPB (V/V)	F	JGJ-069-05
4VP042013A	CFA-1931	470-475		1,2-Dichloroethane	6.5	U		PPB (V/V)	F	JGJ-069-05
4VP042013A	CFA-1931	470-475		1,1,1-Trichloroethane	8.3			PPB (V/V)	F	JGJ-069-05
4VP042013A	CFA-1931	470-475		Benzene	19			PPB (V/V)	F	JGJ-069-05
4VP042013A	CFA-1931	470-475		Carbon tetrachloride	6.5	U		PPB (V/V)	F	JGJ-069-05
4VP042013A	CFA-1931	470-475		1,2-Dichloropropane	6.5	U		PPB (V/V)	F	JGJ-069-05
4VP042013A	CFA-1931	470-475		Trichloroethene	340			PPB (V/V)	F	JGJ-069-05
4VP042013A	CFA-1931	470-475		4-Methyl-2-pentanone	6.5	U		PPB (V/V)	F	JGJ-069-05
4VP042013A	CFA-1931	470-475		cis-1,3-Dichloropropene	6.5	U		PPB (V/V)	F	JGJ-069-05
4VP042013A	CFA-1931	470-475		trans-1,3-Dichloropropene	6.5	U		PPB (V/V)	F	JGJ-069-05
4VP042013A	CFA-1931	470-475		1,1,2-Trichloroethane	6.5	U		PPB (V/V)	F	JGJ-069-05
4VP042013A	CFA-1931	470-475		Toluene	6.5	U		PPB (V/V)	F	JGJ-069-05
4VP042013A	CFA-1931	470-475		2-Hexanone	5.6	U		PPB (V/V)	F	JGJ-069-05
4VP042013A	CFA-1931	470-475		1,2-Dibromoethane	6.5	U		PPB (V/V)	F	JGJ-069-05
4VP042013A	CFA-1931	470-475		Tetrachloroethene	12			PPB (V/V)	F	JGJ-069-05
4VP042013A	CFA-1931	470-475		Chlorobenzene	6.5	U		PPB (V/V)	F	JGJ-069-05
4VP042013A	CFA-1931	470-475		Ethylbenzene	6.5	U		PPB (V/V)	F	JGJ-069-05
4VP042013A	CFA-1931	470-475		m,p-Xylenes	13	U		PPB (V/V)	F	JGJ-069-05
4VP042013A	CFA-1931	470-475		Styrene	6.5	U		PPB (V/V)	F	JGJ-069-05
4VP042013A	CFA-1931	470-475		1,1,2,2-Tetrachloroethane	6.5	U		PPB (V/V)	F	JGJ-069-05

Table A-3. (continued).

Field Sample	Number	Location	Depth	Compound	Sample Result	Result Qualifier	Validation Flag	Sample Units	Organic TIC	L&V Report Number
4VP042013A	CFA-1931	470-475		o-Xylene	6.5	U		PPB (V/V)	F	JGJ-069-05
4VP042013A	CFA-1931	470-475		4-Ethyltoluene	6.5	U		PPB (V/V)	F	JGJ-069-05
4VP042013A	CFA-1931	470-475		1,3,5-Trimethylbenzene	6.5	U		PPB (V/V)	F	JGJ-069-05
4VP042013A	CFA-1931	470-475		1,2,4-Trimethylbenzene	6.5	U		PPB (V/V)	F	JGJ-069-05
4VP042013A	CFA-1931	470-475		Benzyl chloride	6.5	U		PPB (V/V)	F	JGJ-069-05
4VP042013A	CFA-1931	470-475		1,3-Dichlorobenzene	6.5	U		PPB (V/V)	F	JGJ-069-05
4VP042013A	CFA-1931	470-475		1,4-Dichlorobenzene	6.5	U		PPB (V/V)	F	JGJ-069-05
4VP042013A	CFA-1931	470-475		1,2-Dichlorobenzene	6.5	U		PPB (V/V)	F	JGJ-069-05
4VP042013A	CFA-1931	470-475		1,2,4-Trichlorobenzene	7	U		PPB (V/V)	F	JGJ-069-05
4VP042013A	CFA-1931	470-475		Hexachlorobutadiene	6.5	U		PPB (V/V)	F	JGJ-069-05
4VP042013A	CFA-1931	470-475		CYCLOHEXANE	14	NJ	NJ	PPB (V/V)	T	
4VP042013A	CFA-1931	470-475		CYCLOTETRASILOXANE, OCTAMETHYL-	36	NJ	R	PPB (V/V)	T	
4VP043013A	CFA-1932	255-260		Dichlorodifluoromethane	2.7	U		PPB (V/V)	F	JGJ-069-05
4VP043013A	CFA-1932	255-260		Chloromethane	1.2			PPB (V/V)	F	JGJ-069-05
4VP043013A	CFA-1932	255-260		Dichlorotetrafluoroethane	1.3	U		PPB (V/V)	F	JGJ-069-05
4VP043013A	CFA-1932	255-260		Vinyl Chloride	1.2	U		PPB (V/V)	F	JGJ-069-05
4VP043013A	CFA-1932	255-260		Bromomethane	1.1	U		PPB (V/V)	F	JGJ-069-05
4VP043013A	CFA-1932	255-260		Chloroethane	1.2	U		PPB (V/V)	F	JGJ-069-05
4VP043013A	CFA-1932	255-260		Acetone	8.4		U	PPB (V/V)	F	JGJ-069-05
4VP043013A	CFA-1932	255-260		Trichlorofluoromethane	1.9			PPB (V/V)	F	JGJ-069-05
4VP043013A	CFA-1932	255-260		1,1-Dichloroethene	1.3	U		PPB (V/V)	F	JGJ-069-05
4VP043013A	CFA-1932	255-260		Methylene Chloride	1.2	U		PPB (V/V)	F	JGJ-069-05
4VP043013A	CFA-1932	255-260		1,1,2-Trichlorotrifluoroethane	1.2	U		PPB (V/V)	F	JGJ-069-05
4VP043013A	CFA-1932	255-260		Carbon disulfide	1.2	U		PPB (V/V)	F	JGJ-069-05
4VP043013A	CFA-1932	255-260		trans-1,2-Dichloroethene	1.3	U		PPB (V/V)	F	JGJ-069-05
4VP043013A	CFA-1932	255-260		1,1-Dichloroethane	1.2	U		PPB (V/V)	F	JGJ-069-05
4VP043013A	CFA-1932	255-260		2-Butanone	1.2	U		PPB (V/V)	F	JGJ-069-05
4VP043013A	CFA-1932	255-260		cis-1,2-Dichloroethene	1.2	U		PPB (V/V)	F	JGJ-069-05
4VP043013A	CFA-1932	255-260		Chloroform	1.2	U		PPB (V/V)	F	JGJ-069-05
4VP043013A	CFA-1932	255-260		1,2-Dichloroethane	1.2	U		PPB (V/V)	F	JGJ-069-05
4VP043013A	CFA-1932	255-260		1,1,1-Trichloroethane	3.6			PPB (V/V)	F	JGJ-069-05
4VP043013A	CFA-1932	255-260		Benzene	1.2	U		PPB (V/V)	F	JGJ-069-05
4VP043013A	CFA-1932	255-260		Carbon tetrachloride	1.2	U		PPB (V/V)	F	JGJ-069-05
4VP043013A	CFA-1932	255-260		1,2-Dichloropropane	1.2	U		PPB (V/V)	F	JGJ-069-05
4VP043013A	CFA-1932	255-260		Trichloroethene	2.6			PPB (V/V)	F	JGJ-069-05
4VP043013A	CFA-1932	255-260		4-Methyl-2-pentanone	1.2	U		PPB (V/V)	F	JGJ-069-05
4VP043013A	CFA-1932	255-260		cis-1,3-Dichloropropene	1.2	U		PPB (V/V)	F	JGJ-069-05
4VP043013A	CFA-1932	255-260		trans-1,3-Dichloropropene	1.2	U		PPB (V/V)	F	JGJ-069-05
4VP043013A	CFA-1932	255-260		1,1,2-Trichloroethane	1.2	U		PPB (V/V)	F	JGJ-069-05
4VP043013A	CFA-1932	255-260		Toluene	2.3		U	PPB (V/V)	F	JGJ-069-05
4VP043013A	CFA-1932	255-260		2-Hexanone	1.1	U		PPB (V/V)	F	JGJ-069-05
4VP043013A	CFA-1932	255-260		1,2-Dibromoethane	1.2	U		PPB (V/V)	F	JGJ-069-05
4VP043013A	CFA-1932	255-260		Tetrachloroethene	3.6			PPB (V/V)	F	JGJ-069-05
4VP043013A	CFA-1932	255-260		Chlorobenzene	1.2	U		PPB (V/V)	F	JGJ-069-05
4VP043013A	CFA-1932	255-260		Ethylbenzene	1.2	U		PPB (V/V)	F	JGJ-069-05
4VP043013A	CFA-1932	255-260		m,p-Xylenes	2.5	U		PPB (V/V)	F	JGJ-069-05
4VP043013A	CFA-1932	255-260		Styrene	1.2	U		PPB (V/V)	F	JGJ-069-05
4VP043013A	CFA-1932	255-260		1,1,2-Tetrachloroethane	1.2	U		PPB (V/V)	F	JGJ-069-05
4VP043013A	CFA-1932	255-260		o-Xylene	1.2	U		PPB (V/V)	F	JGJ-069-05
4VP043013A	CFA-1932	255-260		4-Ethyltoluene	1.2	U		PPB (V/V)	F	JGJ-069-05
4VP043013A	CFA-1932	255-260		1,3,5-Trimethylbenzene	1.2	U		PPB (V/V)	F	JGJ-069-05
4VP043013A	CFA-1932	255-260		1,2,4-Trimethylbenzene	1.2	U		PPB (V/V)	F	JGJ-069-05
4VP043013A	CFA-1932	255-260		Benzyl chloride	1.2	U		PPB (V/V)	F	JGJ-069-05
4VP043013A	CFA-1932	255-260		1,3-Dichlorobenzene	1.2	U		PPB (V/V)	F	JGJ-069-05
4VP043013A	CFA-1932	255-260		1,4-Dichlorobenzene	1.2	U		PPB (V/V)	F	JGJ-069-05
4VP043013A	CFA-1932	255-260		1,2-Dichlorobenzene	1.2	U		PPB (V/V)	F	JGJ-069-05
4VP043013A	CFA-1932	255-260		1,2,4-Trichlorobenzene	1.3	U		PPB (V/V)	F	JGJ-069-05
4VP043013A	CFA-1932	255-260		Hexachlorobutadiene	1.2	U		PPB (V/V)	F	JGJ-069-05
4VP043013A	CFA-1932	255-260		ISOBUTANE	16	NJ	NJ	PPB (V/V)	T	
4VP043013A	CFA-1932	255-260		BUTANE, 2-METHYL-	11	NJ	NJ	PPB (V/V)	T	
4VP043013A	CFA-1932	255-260		PENTANE	1.6	NJ	NJ	PPB (V/V)	T	
4VP043013A	CFA-1932	255-260		CYCLOTRISILOXANE, HEXAMETHYL-	1.7	NJ	NJ	PPB (V/V)	T	
4VP043013A	CFA-1932	255-260		CYCLOTETRASILOXANE, OCTAMETHYL-	8.8	NJ	R	PPB (V/V)	T	
4VP044013A	CFA-1932	465-470		Dichlorodifluoromethane	1.4	U		PPB (V/V)	F	JGJ-069-05
4VP044013A	CFA-1932	465-470		Chloromethane	1.3	U		PPB (V/V)	F	JGJ-069-05
4VP044013A	CFA-1932	465-470		Dichlorotetrafluoroethane	1.4	U		PPB (V/V)	F	JGJ-069-05
4VP044013A	CFA-1932	465-470		Vinyl Chloride	1.3	U		PPB (V/V)	F	JGJ-069-05
4VP044013A	CFA-1932	465-470		Bromomethane	1.2	U		PPB (V/V)	F	JGJ-069-05
4VP044013A	CFA-1932	465-470		Chloroethane	1.2	U		PPB (V/V)	F	JGJ-069-05
4VP044013A	CFA-1932	465-470		Acetone	8.8			PPB (V/V)	F	JGJ-069-05
4VP044013A	CFA-1932	465-470		Trichlorofluoromethane	1.3	U		PPB (V/V)	F	JGJ-069-05
4VP044013A	CFA-1932	465-470		1,1-Dichloroethene	1.4	U		PPB (V/V)	F	JGJ-069-05
4VP044013A	CFA-1932	465-470		Methylene Chloride	1.3	U		PPB (V/V)	F	JGJ-069-05
4VP044013A	CFA-1932	465-470		1,1,2-Trichlorotrifluoroethane	1.3	U		PPB (V/V)	F	JGJ-069-05
4VP044013A	CFA-1932	465-470		Carbon disulfide	1.3	U		PPB (V/V)	F	JGJ-069-05
4VP044013A	CFA-1932	465-470		trans-1,2-Dichloroethene	1.4	U		PPB (V/V)	F	JGJ-069-05
4VP044013A	CFA-1932	465-470		1,1-Dichloroethane	1.3	U		PPB (V/V)	F	JGJ-069-05

Table A-3. (continued).

Field Sample	Number	Location	Depth	Compound	Sample Result	Result Qualifier	Validation Flag	Sample Units	Organic TIC	L&V Report Number
4VP044013A	CFA-1932	465-470		2-Butanone	1.4			PPB (V/V)	F	JGJ-069-05
4VP044013A	CFA-1932	465-470		cis-1,2-Dichloroethene	1.3	U		PPB (V/V)	F	JGJ-069-05
4VP044013A	CFA-1932	465-470		Chloroform	1.3	U		PPB (V/V)	F	JGJ-069-05
4VP044013A	CFA-1932	465-470		1,2-Dichloroethane	1.3	U		PPB (V/V)	F	JGJ-069-05
4VP044013A	CFA-1932	465-470		1,1,1-Trichloroethane	2.1			PPB (V/V)	F	JGJ-069-05
4VP044013A	CFA-1932	465-470		Benzene	1.3	U		PPB (V/V)	F	JGJ-069-05
4VP044013A	CFA-1932	465-470		Carbon tetrachloride	1.3	U		PPB (V/V)	F	JGJ-069-05
4VP044013A	CFA-1932	465-470		1,2-Dichloropropane	1.3	U		PPB (V/V)	F	JGJ-069-05
4VP044013A	CFA-1932	465-470		Trichloroethylene	1.4			PPB (V/V)	F	JGJ-069-05
4VP044013A	CFA-1932	465-470		4-Methyl-2-pentanone	1.3	U		PPB (V/V)	F	JGJ-069-05
4VP044013A	CFA-1932	465-470		cis-1,3-Dichloropropene	1.3	U		PPB (V/V)	F	JGJ-069-05
4VP044013A	CFA-1932	465-470		trans-1,3-Dichloropropene	1.3	U		PPB (V/V)	F	JGJ-069-05
4VP044013A	CFA-1932	465-470		1,1,2-Trichloroethane	1.3	U		PPB (V/V)	F	JGJ-069-05
4VP044013A	CFA-1932	465-470		Toluene	1.3	U		PPB (V/V)	F	JGJ-069-05
4VP044013A	CFA-1932	465-470		2-Hexanone	1.1	U		PPB (V/V)	F	JGJ-069-05
4VP044013A	CFA-1932	465-470		1,2-Dibromoethane	1.3	U		PPB (V/V)	F	JGJ-069-05
4VP044013A	CFA-1932	465-470		Tetrachloroethene	2.4			PPB (V/V)	F	JGJ-069-05
4VP044013A	CFA-1932	465-470		Chlorobenzene	1.3	U		PPB (V/V)	F	JGJ-069-05
4VP044013A	CFA-1932	465-470		Ethylbenzene	1.3	U		PPB (V/V)	F	JGJ-069-05
4VP044013A	CFA-1932	465-470		m,p-Xylenes	2.6	U		PPB (V/V)	F	JGJ-069-05
4VP044013A	CFA-1932	465-470		Styrene	1.3	U		PPB (V/V)	F	JGJ-069-05
4VP044013A	CFA-1932	465-470		1,1,2,2-Tetrachloroethane	1.3	U		PPB (V/V)	F	JGJ-069-05
4VP044013A	CFA-1932	465-470		o-Xylene	1.3	U		PPB (V/V)	F	JGJ-069-05
4VP044013A	CFA-1932	465-470		4-Ethyltoluene	1.3	U		PPB (V/V)	F	JGJ-069-05
4VP044013A	CFA-1932	465-470		1,3,5-Trimethylbenzene	1.3	U		PPB (V/V)	F	JGJ-069-05
4VP044013A	CFA-1932	465-470		1,2,4-Trimethylbenzene	1.3	U		PPB (V/V)	F	JGJ-069-05
4VP044013A	CFA-1932	465-470		Benzyl chloride	1.3	U		PPB (V/V)	F	JGJ-069-05
4VP044013A	CFA-1932	465-470		1,3-Dichlorobenzene	1.3	U		PPB (V/V)	F	JGJ-069-05
4VP044013A	CFA-1932	465-470		1,4-Dichlorobenzene	1.3	U		PPB (V/V)	F	JGJ-069-05
4VP044013A	CFA-1932	465-470		1,2-Dichlorobenzene	1.3	U		PPB (V/V)	F	JGJ-069-05
4VP044013A	CFA-1932	465-470		1,2,4-Trichlorobenzene	1.4	U		PPB (V/V)	F	JGJ-069-05
4VP044013A	CFA-1932	465-470		Hexachlorobutadiene	1.3	U		PPB (V/V)	F	JGJ-069-05
4VP044013A	CFA-1932	465-470		ISOPROPYL ALCOHOL	2.8	NJ	NJ	PPB (V/V)	T	
4VP044013A	CFA-1932	465-470		UNKNOWN	2.2	J	J	PPB (V/V)	T	
4VP044013A	CFA-1932	465-470		1-PENTENE, 2,4,4-TRIMETHYL-	2.5	NJ	NJ	PPB (V/V)	T	
4VP044013A	CFA-1932	465-470		CYCLOTRISSILOXANE, HEXAMETHYL-	2.3	NJ	R	PPB (V/V)	T	
4VP044013A	CFA-1932	465-470		CYCLOTETRASILOXANE, OCTAMETHYL-	9.8	NJ	R	PPB (V/V)	T	
4VP044013A	CFA-1932	465-470		1-HEXANOL, 2-ETHYL-	2.2	NJ	NJ	PPB (V/V)	T	
4VP045013A	FIELD BLANK	NA		Dichlorodifluoromethane	1.5	U		PPB (V/V)	F	JGJ-069-05
4VP045013A	FIELD BLANK	NA		Chloromethane	1.4	U		PPB (V/V)	F	JGJ-069-05
4VP045013A	FIELD BLANK	NA		Dichlorotetrafluoroethane	1.5	U		PPB (V/V)	F	JGJ-069-05
4VP045013A	FIELD BLANK	NA		Vinyl Chloride	1.4	U		PPB (V/V)	F	JGJ-069-05
4VP045013A	FIELD BLANK	NA		Bromomethane	1.3	U		PPB (V/V)	F	JGJ-069-05
4VP045013A	FIELD BLANK	NA		Chloroethane	1.3	U		PPB (V/V)	F	JGJ-069-05
4VP045013A	FIELD BLANK	NA		Acetone	8.1			PPB (V/V)	F	JGJ-069-05
4VP045013A	FIELD BLANK	NA		Trichlorofluoromethane	1.4	U		PPB (V/V)	F	JGJ-069-05
4VP045013A	FIELD BLANK	NA		1,1-Dichloroethene	1.5	U		PPB (V/V)	F	JGJ-069-05
4VP045013A	FIELD BLANK	NA		Methylene Chloride	1.4	U		PPB (V/V)	F	JGJ-069-05
4VP045013A	FIELD BLANK	NA		1,1,2-Trichlorotrifluoroethane	1.4	U		PPB (V/V)	F	JGJ-069-05
4VP045013A	FIELD BLANK	NA		Carbon disulfide	1.4	U		PPB (V/V)	F	JGJ-069-05
4VP045013A	FIELD BLANK	NA		trans-1,2-Dichloroethene	1.5	U		PPB (V/V)	F	JGJ-069-05
4VP045013A	FIELD BLANK	NA		1,1-Dichloroethane	1.4	U		PPB (V/V)	F	JGJ-069-05
4VP045013A	FIELD BLANK	NA		2-Butanone	1.4	U		PPB (V/V)	F	JGJ-069-05
4VP045013A	FIELD BLANK	NA		cis-1,2-Dichloroethene	1.4	U		PPB (V/V)	F	JGJ-069-05
4VP045013A	FIELD BLANK	NA		Chloroform	1.4	U		PPB (V/V)	F	JGJ-069-05
4VP045013A	FIELD BLANK	NA		1,2-Dichloroethane	1.4	U		PPB (V/V)	F	JGJ-069-05
4VP045013A	FIELD BLANK	NA		1,1,1-Trichloroethane	1.4	U		PPB (V/V)	F	JGJ-069-05
4VP045013A	FIELD BLANK	NA		Benzene	1.4	U		PPB (V/V)	F	JGJ-069-05
4VP045013A	FIELD BLANK	NA		Carbon tetrachloride	1.4	U		PPB (V/V)	F	JGJ-069-05
4VP045013A	FIELD BLANK	NA		1,2-Dichloropropane	1.4	U		PPB (V/V)	F	JGJ-069-05
4VP045013A	FIELD BLANK	NA		Trichloroethene	1.4	U		PPB (V/V)	F	JGJ-069-05
4VP045013A	FIELD BLANK	NA		4-Methyl-2-pentanone	1.4	U		PPB (V/V)	F	JGJ-069-05
4VP045013A	FIELD BLANK	NA		cis-1,3-Dichloropropene	1.4	U		PPB (V/V)	F	JGJ-069-05
4VP045013A	FIELD BLANK	NA		trans-1,3-Dichloropropene	1.4	U		PPB (V/V)	F	JGJ-069-05
4VP045013A	FIELD BLANK	NA		1,1,2-Trichloroethane	1.4	U		PPB (V/V)	F	JGJ-069-05
4VP045013A	FIELD BLANK	NA		Toluene	3.5			PPB (V/V)	F	JGJ-069-05
4VP045013A	FIELD BLANK	NA		2-Hexanone	1.2	U		PPB (V/V)	F	JGJ-069-05
4VP045013A	FIELD BLANK	NA		1,2-Dibromoethane	1.4	U		PPB (V/V)	F	JGJ-069-05
4VP045013A	FIELD BLANK	NA		Tetrachloroethene	1.4	U		PPB (V/V)	F	JGJ-069-05
4VP045013A	FIELD BLANK	NA		Chlorobenzene	1.4	U		PPB (V/V)	F	JGJ-069-05
4VP045013A	FIELD BLANK	NA		Ethylbenzene	1.4	U		PPB (V/V)	F	JGJ-069-05
4VP045013A	FIELD BLANK	NA		m,p-Xylenes	2.8	U		PPB (V/V)	F	JGJ-069-05
4VP045013A	FIELD BLANK	NA		Styrene	1.4	U		PPB (V/V)	F	JGJ-069-05
4VP045013A	FIELD BLANK	NA		1,1,2-Tetrachloroethane	1.4	U		PPB (V/V)	F	JGJ-069-05
4VP045013A	FIELD BLANK	NA		o-Xylene	1.4	U		PPB (V/V)	F	JGJ-069-05
4VP045013A	FIELD BLANK	NA		4-Ethyltoluene	1.4	U		PPB (V/V)	F	JGJ-069-05
4VP045013A	FIELD BLANK	NA		1,3,5-Trimethylbenzene	1.4	U		PPB (V/V)	F	JGJ-069-05

Table A-3. (continued).

Field Sample			Compound	Sample Result	Result Qualifier	Validation Flag	Sample Units	Organic TIC	L&V Report Number
Number	Location	Depth							
4VP045013A	FIELD BLANK	NA	1,2,4-Trimethylbenzene	1.4	U		PPB (V/V)	F	JGJ-069-05
4VP045013A	FIELD BLANK	NA	Benzyl chloride	1.4	U		PPB (V/V)	F	JGJ-069-05
4VP045013A	FIELD BLANK	NA	1,3-Dichlorobenzene	1.4	U		PPB (V/V)	F	JGJ-069-05
4VP045013A	FIELD BLANK	NA	1,4-Dichlorobenzene	1.4	U		PPB (V/V)	F	JGJ-069-05
4VP045013A	FIELD BLANK	NA	1,2-Dichlorobenzene	1.4	U		PPB (V/V)	F	JGJ-069-05
4VP045013A	FIELD BLANK	NA	1,2,4-Trichlorobenzene	1.5	U		PPB (V/V)	F	JGJ-069-05
4VP045013A	FIELD BLANK	NA	Hexachlorobutadiene	1.4	U		PPB (V/V)	F	JGJ-069-05
4VP045013A	FIELD BLANK	NA	ISOBUTANE	14	NJ	NJ	PPB (V/V)	T	
4VP045013A	FIELD BLANK	NA	BUTANE, 2-METHYL-	21	NJ	NJ	PPB (V/V)	T	
4VP045013A	FIELD BLANK	NA	ISOPROPYL ALCOHOL	1.8	NJ	NJ	PPB (V/V)	T	
4VP045013A	FIELD BLANK	NA	PENTANE	2.5	NJ	NJ	PPB (V/V)	T	
4VP045013A	FIELD BLANK	NA	CYCLOTRISILOXANE, HEXAMETHYL-	1.4	NJ	R	PPB (V/V)	T	
4VP045013A	FIELD BLANK	NA	CYCLOTETRAPILOXANE, OCTAMETHYL-	6.8	NJ	R	PPB (V/V)	T	
4VP041013A	CFA-1931	295-300	Methane	3.89		U	PPMV	F	DMG-194-05
4VP042013A	CFA-1931	470-475	Methane	2.73	U		PPMV	F	DMG-194-05
4VP043013A	CFA-1932	255-260	Methane	2.23		U	PPMV	F	DMG-194-05
4VP044013A	CFA-1932	465-470	Methane	2.22		U	PPMV	F	DMG-194-05
4VP045013A	FIELD BLANK	NA	Methane	2.24			PPMV	F	DMG-194-05

Appendix B

Central Facilities Area Landfill Moisture Monitoring (October 2004 to October 2005)

Appendix B

Central Facilities Area Landfill Moisture Monitoring (October 2004 to October 2005)

B-1. INTRODUCTION

This appendix presents the analysis of neutron-probe and time-domain-reflectometry (TDR) data used to monitor soil-moisture content at Central Facilities Area (CFA) Landfills I, II, and III. The data from the deep or vertical time-domain reflectometer systems that were installed in the native soil cover at Landfills II and III to a depth of 8 ft are reported and discussed. In addition, moisture monitoring data from five existing neutron-probe access tubes (NATs) are addressed.

The terms *infiltration*, *recharge*, and *drainage* are used throughout this appendix and are defined as follows. Water that moves into the soil is defined as *infiltration*. Water that continues to move downward beyond the evapotranspiration (ET) depth and out of the soil profile is termed *recharge*. Infiltration and recharge are represented by an increase in water storage within a system. In addition to recharge, ET is a large contributor to decreasing storage in near-surface soils, moving water upward and out of the soil. The term *drainage* refers to water movement out of a unit thickness of soil or a decrease in soil moisture but does not indicate the direction of movement.

B-2. NEUTRON-PROBE MOISTURE MONITORING DATA

The goal for the neutron probe monitoring at the landfills is to determine the volume of water infiltrating past the ET or rooting depth. Water that passes through the ET depth might pick up contaminants in the landfill waste and carry them to groundwater. The raw data for the five neutron probe monitoring locations are provided in Tables B-1 through B-5. Because of problems described below with the neutron probe, infiltration, recharge, and drainage for the five NAT locations was not determined.

In late October 2004, the electrical connection between the probe and the unit was damaged. Because of this malfunction, readings were not taken in November or December 2004. The cable was sent to the manufacturer's representative for repair.

Neutron probe readings were performed in January, February, and March of 2005. The electrical connection was again found to be damaged in late March 2005. The cable was sent to the manufacturer's representative for repair. When measurements were resumed in June 2005, it was noted that the spacers that mark the depth along the cable were not at the same positions as the previously positioned spacers. Although the cable appeared to be functioning correctly, the probe readings did not match the previous readings. Thus, probe readings taken from June 2005 are a separate data set from the previous measurements.

B-3. TIME-DOMAIN REFLECTOMETER DATA ANALYSIS

Time-domain reflectometer data were collected from two locations at both Landfills II and III, with the volumetric moisture data collected at 6-in. intervals from the surface to a depth of 8 ft. The vertical time-domain reflectometer systems were installed in August and September 2000. The systems installed were Moisture Point systems from Environmental Sensors, Inc.^a The Moisture Point system consists of an

a. Mention of specific products or manufacturers in this document implies neither endorsement, preference, nor disapproval by the U.S. Government, any of its agencies, or CH2M-WG Idaho, LLC, of the use of a specific product for any purpose.

MP-917, Moisture Point Type-K probes, Campbell Scientific CR10X data logger and COM200 phone modem, solar panel, battery, and probe cables. The MP-917 interrogates the probes and reduces the segment data to a numerical probe data set for export to the CR10X data logger.

This report covers data collected from October 1, 2004 to September 27, 2005. Plots of the time-domain reflectometer data are provided in Figures B-1 through B-4. The plots show the volumetric moisture content for 6-in. intervals from the surface to a depth of 8 ft except for TDR LF2-south. Probe failure occurred at the 5- to 6-ft interval from TDR LF2-south in late July 2002 and has not been corrected because the problem cannot be fixed without digging up the probe. In addition, the 0–6-in. segment in the TDR LF2-north stopped functioning during the monitoring period.

In general, the time-domain reflectometer data showed that the most significant increase in moisture content occurred in mid-March 2005 through May 2005 in response to snowmelt and spring rains.

Monitoring water movement or lack of movement through the soil cover on the landfills is the primary concern of the time-domain reflectometer monitoring at Landfills II and III. The low-permeability layer of the soil cover is located 6 to 18 in. below land surface (bls). During TDR installation, plant roots were seen at least partially penetrating this layer. Moisture content within the low-permeability layer increases and decreases, indicating the movement of water into and out of this compacted layer. Downward water movement through the low-permeability layer can be determined by examining time-domain reflectometer moisture content data below the low-permeability layer. Increasing moisture content below the low-permeability layer indicates that water moved vertically through the low-permeability layer.

B-3.1 Infiltration and Recharge Calculations Based on Time-Domain Reflectometer Data

In general, the time-domain reflectometer data show an increase in moisture content to depths of less than 4 ft during late-winter/spring 2005, but scattered intervals below 4 ft show rises. Spring is the time of year when the most significant infiltration occurs.

Infiltration and drainage calculations are greater than the measured precipitation at the CFA National Oceanic and Atmospheric Administration (NOAA) weather station (Table B-6) for the winter-spring of 2005 at three of the four time-domain reflectometer locations. The calculated infiltration for the time-domain reflectometer locations ranges from 1.16 to 7.53 in. for the March-to-end-of-May period (Table B-7). The measured precipitation at the CFA NOAA weather station is 2.35 in. for winter precipitation and 4.36 in. for April–May precipitation. Similarly, drainage or losses in storage for the time-domain reflectometer arrays range from 0.62 to 7.53 in. of water (Table B-7).

The higher calculated infiltration rates versus the amount of precipitation for depths less than 4 ft could be the result of soil thawing. Changes in moisture content would reflect both an adjustment due to soil thawing and an influx of water from snowmelt. When soil water freezes, the dielectric constant of water reduces from approximately 80 to 5. The time-domain reflectometer probes then indicate a false decrease in water content that is consistent with the decrease in the dielectric constant for water when it is frozen. When the soil thaws, the probes reflect the rise in the dielectric constant as ice turns to liquid, and a false increase in water content is detected. Because the spring thaw occurs more suddenly than soil freezing in the fall, the spring shift is more pronounced on the moisture content curves.

Recharge was evaluated by examining the changes in moisture content within the intervals monitored by the TDRs (Tables B-7 and B-8). Precipitation events other than spring snowmelt in mid-March and spring precipitation in April and May impacted only the 0- to 6-in. depth interval. At

Landfills II and III, from depths of 4 to 8 ft or below the estimated ET depth of 3 to 4 ft, there were small changes in soil moisture content. This is shown in vertical moisture profiles shown on Figures B-5 and B-6. However, all four TDR locations showed at least one segment with moisture content increases greater than 2.5 percent or a change of 0.025 in moisture content below a depth of 4 ft (Tables B-7 and B-8). The TDR intervals below 4 ft showed only small increases in moisture content suggesting that any recharge was slight, less than 0.65 in. It appears that ET consumed most of the infiltrated water for the spring of 2005.

B-3.2 Water Storage Analyses for the Time-Domain Reflectometer Locations

Infiltration, drainage, and ET affect the amount of water in storage in the soil profile. Water storage analysis in this section reflects the change in moisture content over a period of approximately 1 year. This 1-year period is used to evaluate the net impacts of infiltration, drainage, and ET on the soil profile (i.e., gaining or losing moisture). The change in storage is represented by the following equation:

$$\Delta S = I - R - ET \quad (B-1)$$

where

ΔS	=	change in storage
I	=	infiltration
R	=	recharge
ET	=	evapotranspiration.

The infiltration, drainage, and ET out of soil are nearly impossible to measure directly. However, the time-domain reflectometer probes do measure moisture content from which change in storage (ΔS) can be inferred. If the change in storage is positive over time, then there is a net gain of water in the soil profile. Conversely, if the change is negative, there is a net water loss from the soil profile. The 3 to 4-ft ET depth is based on NAT data. The ET depth is maintained as 3 to 4 ft to remain consistent with previous reports, but actual ET depths could vary across the landfills.

Changes in storage were estimated for the entire 8-ft depth of each time-domain reflectometer below land surface (Table B-9). The change in storage (ΔS) was calculated for each interval by multiplying the change in moisture content, ΔMC , by the thickness of the soil unit (L) or 6 in. for each segment, mathematically expressed as follows:

$$\Delta S = \Delta MC \times L \quad (B-2)$$

where:

ΔS	=	change in storage
ΔMC	=	moisture content
L	=	soil unit thickness.

The change in storage for the 8-ft profile was calculated for September 30, 2004, through September 27, 2005, for the TDRs at Landfills II and III. This one-year period encompasses an entire yearly moisture cycle and includes spring infiltration as well as the summer ET.

An analysis of the change in water storage indicated small changes for the four TDRs within the landfill cap, the ET zone, and below the ET zone. There were increases in storage over the monitoring period for the 0- to 2-ft depth for the TDRs LF2-north and LF3-west and decreases at LF2-south and LF3-east (Table B-9). One of the TDRs at Landfill III (LF3-west) showed a loss (-0.92 in.) in storage for the 0- to 8-ft depth interval over the monitoring period, while the other TDR (LF3-west) showed a gain of 0.35 inches. The two TDRs at Landfill II showed gains in water storage of 0.14 and 0.56 in. for LF2-south and LF2-north, respectively, for the 0- to 8-ft interval. For the 4 to 8 ft depth interval or the interval below the estimated ET depth of 4 ft, there was a loss in storage at both Landfill III TDR arrays. The TDRs at Landfill II showed a slight loss at LF2-north of -0.09 in. and a slight gain of 0.13 in. for the depth interval of 4 to 8 ft.

Table B-1. Neutron probe measurements for LF2-03.

Depth	9/22/2004	10/13/2004	10/14/2004	1/25/2005	2/9/2005	3/2/2005	3/29/2005	6/29/2005	7/25/2005	8/17/2005	9/15/2005
0	1815	125	1715	5211	5511	5397	5547	645	246	245	216
0.92	3520	3140	3359	4284	4272	4347	4231	4500	3113	2956	2832
1.92	3123	3619	2998	3927	2994	3891	3830	6000	3714	3566	3377
2.92	2861	2959	2995	3003	3025	2968	2932	3765	3305	3318	3111
3.92	3089	2907	3074	2969	3123	2991	3104	3672	3602	3465	3376
4.92	3259	3104	3215	3163	3136	3103	3176	3748	3534	3411	3395
5.92	3426	3201	3542	3167	3162	3271	3208	3431	3622	3536	3358
6.92	3859	4823	3794	3573	4681	3494	3582	3417	3217	3405	3289
7.92	3626	3707	3614	3898	3640	3898	3911	4079	5491	5591	5278
8.92	3318	3609	3492	3590	3607	3535	3550	3726	4091	3855	3802
9.92	4279	3719	4418	3452	3719	3467	3430	4195	3828	3778	3877
10.92	4090	4690	4008	4410	4750	4502	4546	4346	4143	4038	4051
11.92	3630	3696	3583	4013	3623	4058	4102	3609	4500	4444	4534
12.92	3859	3586	3825	3710	3527	3669	3680	3651	3668	3711	3662
13.92	3972	4103	3998	3834	3908	3725	3858	3900	3603	3555	3668
14.92	4049	4203	3999	4133	4276	4041	3981	4215	4033	4027	4006
15.92	3731	3601	3645	3994	3606	4080	4135	3609	4237	4276	4259
16.92	4792	3468	4829	3649	3458	3687	3628	3533	3634	3664	3687
17.92	5701	5386	5676	4184	5466	4289	4373	4641	3409	3337	3389
18.92	4324	4016	4567	5018	4499	5336	5302	3288	4676	4761	4741
19.92	7407	8062	7552	3948	7622	3951	4067	8171	3369	3376	3464
20.92	8993	7631	9001	7703	7302	7872	7848	8189	8254	8284	8127
21.92				8704		8831	8925		7902	7893	7899

Note: Under each date are the neutron probe counts.

Table B-2. Neutron probe measurements in LF2-04.

Depth	8/19/2004	9/22/2004	10/13/2004	10/14/2004	1/25/2005	2/9/2005	3/2/2005	6/29/2005	7/25/2005	8/17/2005	9/15/2005
0.14	2815	669	517	2709	5340	5374	5281	5359	1523	977	917
1.14	2949	3104	3004	2906	3112	3075	3082	3183	3137	2890	2746
2.14	2920	2775	2878	2917	2888	2925	2987	2863	3209	2989	2959
3.14	2904	2961	2879	2745	2885	2950	2878	2946	3897	3312	2917
4.14	3002	2875	3050	2925	3087	3035	3015	2974	4060	3262	3312
5.14	3414	3185	3155	3308	3068	3078	3194	3149	3883	3572	3693
6.14	3193	3309	3295	3236	3398	3365	3364	3381	4194	3824	3755
7.14	3445	3399	3433	3577	3144	3206	3102	3213	4175	4000	3672
8.14	3844	3691	3621	3767	3407	3409	3438	3471	4028	3813	3758
9.14	4273	4335	4339	4271	3815	3697	3714	3811	4304	4064	4012
10.14	4391	4247	4250	4305	4235	4254	4195	4242	5161	4883	4774
11.14	3712	4202	4350	3756	4378	4355	4232	4308	5196	5064	5013
12.14	3997	3735	3747	3986	3690	3721	3571	3673	4584	4420	4641
13.14	3913	4211	4110	3761	3967	3945	3857	3970	4277	4315	4136
14.14	4108	4113	3995	4107	3833	3893	3930	3781	4387	4531	4291
15.14	3662	3575	3735	3686	4004	3958	3941	4039	4657	4587	4560
16.14	4045	3650	3727	4125	3698	3755	3677	3663	4195	4032	4050
17.14	3471	3745	3613	3295	4119	4032	4063	4063	4144	4145	4043
18.14	3523	3260	3327	3458	3287	3367	3377	3473	4863	3993	3810
19.14	4309	3745	3525	4203	3366	3441	3448	3443	4305	4120	4106
20.14	5856	3260	6039	5913	3897	3808	3880	3849	4354	4388	4274
21.14	8667	3421	6458	8809	5915	5928	6043	5887	6730	6633	6582
	5944				8091	8110	8237	8148	7312	7198	7287
	6583										7350

Note: Under each date are the neutron probe counts.

Table B-3. Neutron probe measurements for LF2-07.

Depth	9/22/2004	10/13/2004	10/14/2004	1/25/2005	2/9/2005	3/2/2005	6/29/2005	7/25/2005	8/17/2005	9/15/2005
85	51	62	2292	140	589	533	68	55	65	47
0	1638	129	1196	5951	5892	6440	6468	371	172	161
0.84	4434	3297	4507	4240	4348	4109	4050	4346	2827	2517
1.84	3239	3791	3325	3583	3593	3704	3680	6414	4618	4358
2.84	4431	3749	4506	4073	4117	4053	3963	5100	3662	3425
3.84	5737	5372	5676	5395	5096	5220	5246	5704	5201	4840
4.84	5140	5849	5061	5777	5701	5707	5718	6378	6238	6079
5.84	4719	5642	4759	4941	4755	4907	4781	6366	6393	6383
6.84	5983	5311	6028	4768	4669	4840	4792	6170	5977	5946
7.84	6314	1282	6406	5953	6055	5924	5896	6289	6127	5989
8.84	6534	4683	6566	5825	5856	5830	5890	12562	13064	12886
9.84	5348	5867	5482	6781	6732	6683	6719	6079	5686	5443
10.84	7186	6723	7187	5515	5503	5455	5488	5779	5779	5935
11.84	5162	6462	5144	7260	7269	7444	7173	7284	5987	7132
12.84	5409	5305	5426	5290	5148	5156	5113	6043	5807	6024
13.84	6043	6748	6166	5409	5485	5399	5269	5963	7055	5805
14.84	7344	7915	7275	5900	6051	5978	6019	6999	7943	6863
15.84	8058	9238	7940	7485	7235	7323	7311	7891	10283	7984
16.84	14511	11770	14624	8546	8217	8423	8392	10429	13422	10315
17.84	7475	8103	7434	14736	14436	14780	14693	14005	7826	13607
7537	7880		7294	7133	7178	7309	7415	7777	7647	7710
							7621			7645

Note: Under each date are the neutron probe counts.

Table B-4. Neutron probe measurements for LF3-03.

Depth	9/22/2004	10/13/2004	10/14/2004	10/14/2004	1/25/2005	2/9/2005	6/29/2005	7/25/2005	8/17/2005	9/15/2005
	74	45	47	51	538	314	46	52	59	60
-0.3	615	97	441	499	6002	6483	140	96	97	104
0.7	3865	3341	3859	3697	5186	5054	3510	1971	1835	1824
1.7	5102	3818	5060	5095	4037	4067	4135	3562	3566	3471
2.7	3931	5870	3947	3971	5620	5377	7559	6579	6386	6316
3.7	3120	3135	3086	3050	3122	2981	4493	4435	4386	4218
4.7	2912	3023	2941	3015	3011	3077	3911	3634	3484	3629
5.7	2918	2834	3034	2943	2871	2956	3649	3583	3410	3434
6.7	2944	3022	2969	3094	2917	2961	3455	3299	3212	3376
7.7	3465	3153	3413	3483	3103	2942	3544	3472	3453	3474
8.7	3678	3355	3613	3682	3368	3486	3670	3612	3553	3654
9.7	3618	3566	3674	3599	3688	3591	3961	3863	3838	3908
10.7	3318	3417	3247	3348	3577	3604	4015	4005	4032	3976
11.7	3993	4911	3941	4035	3346	3423	3604	3641	3595	3553
12.7	4010	4029	4038	3864	3879	3989	4102	3963	3854	3896
13.7	4137	3756	4099	4036	3853	4012	4480	4642	4629	4719
14.7	3605	3828	3664	3734	4024	4050	4388	4192	4188	4294
15.7	3918	3979	4046	3890	3664	3586	3712	3818	3714	3801
16.7	3748	3582	3724	3698	3994	3919	3912	3844	3865	3816
17.7	3689	3963	3780	3724	3741	3712	3848	4029	3968	3898
18.7	3901	3909	3881	3848	3604	3594	3637	3572	3653	
						3925	4648	4504	4437	3416
										19.7

Table B-5. Neutron probe measurements for LF3-05.

Depth	9/22/2004	10/13/2004	10/14/2004	1/25/2005	2/9/2005	3/2/2005	3/2/2005	3/23/2005	6/29/2005	7/25/2005	8/17/2005	9/15/2005
	102	80	78	2031	820	533	596	609	498	86	40	49
0.1	3378	3299	3206	5122	5312	5228	5179	5360	1515	2502	841	803
1.1	3830	3888	3790	3811	3876	3984	3822	7095	4448	3598	3345	3209
2.1	3619	3665	3646	3161	3259	3096	3268	3184	4062	4147	3519	3391
3.1	3843	3756	3900	3822	3858	3923	3916	3863	3812	4595	4249	4168
4.1	5039	5045	4991	4741	4586	4706	4763	4712	5005	4034	4021	3932
5.1	3477	3442	3608	4789	4719	4770	4765	4720	4588	5403	5481	5540
6.1	2474	2580	2589	3370	3412	3427	3446	3542	3256	4029	4293	4316
7.1	2742	2818	2633	2520	2598	2506	2574	2558	2491	2626	2883	2685
8.1	2825	2893	2914	2788	2730	2737	2728	2748	2671	2625	2785	2812
9.1	3047	2949	3034	2877	2869	3036	2890	2999	2874	2785	2898	2796
10.1	3272	3185	3135	3007	2991	2939	2931	2966	2934	3021	3038	3024
11.1	3861	3898	3949	3170	3218	3096	3303	3225	3305	2895	2856	2839
12.1	4115	4321	4133	3859	3898	3840	3876	3829	3804	3676	3709	3697
13.1	3438	3482	3540	4223	4155	4131	4169	4103	4172	3746	3885	3717
14.1	4048	3843	3906	3395	3410	3327	3474	3498	3442	3500	3510	3623
15.1	4313	4200	4313	3999	3861	3959	3951	4013	3872	3725	3785	3792
16.1	4029	3877	3983	4165	4209	4243	4210	4256	4283	3908	3752	3817
17.1	3855	3855	3966	3971	3954	3915	3877	3813	3981	4054	3908	3866
18.1	4862	4898	4835	3882	3896	3895	3878	3912	3847	4111	4129	4073
19.1	5424	5550	5507	4595	4566	4810	4674	4642	4858	4232	3936	4046
20.1	3650	3728	3635	5175	5133	5225	5241	5203	5637	4668	3946	4494
21.1	9983	9997	10018	3710	3720	3797	3800	3748	3709	3917	6618	4091
22.1	10424	10362	10510	9108	9201	9217	9377	9357	9847	7958	water	6868
23.1				10592	11360							

Note: Under each date are the neutron probe counts.

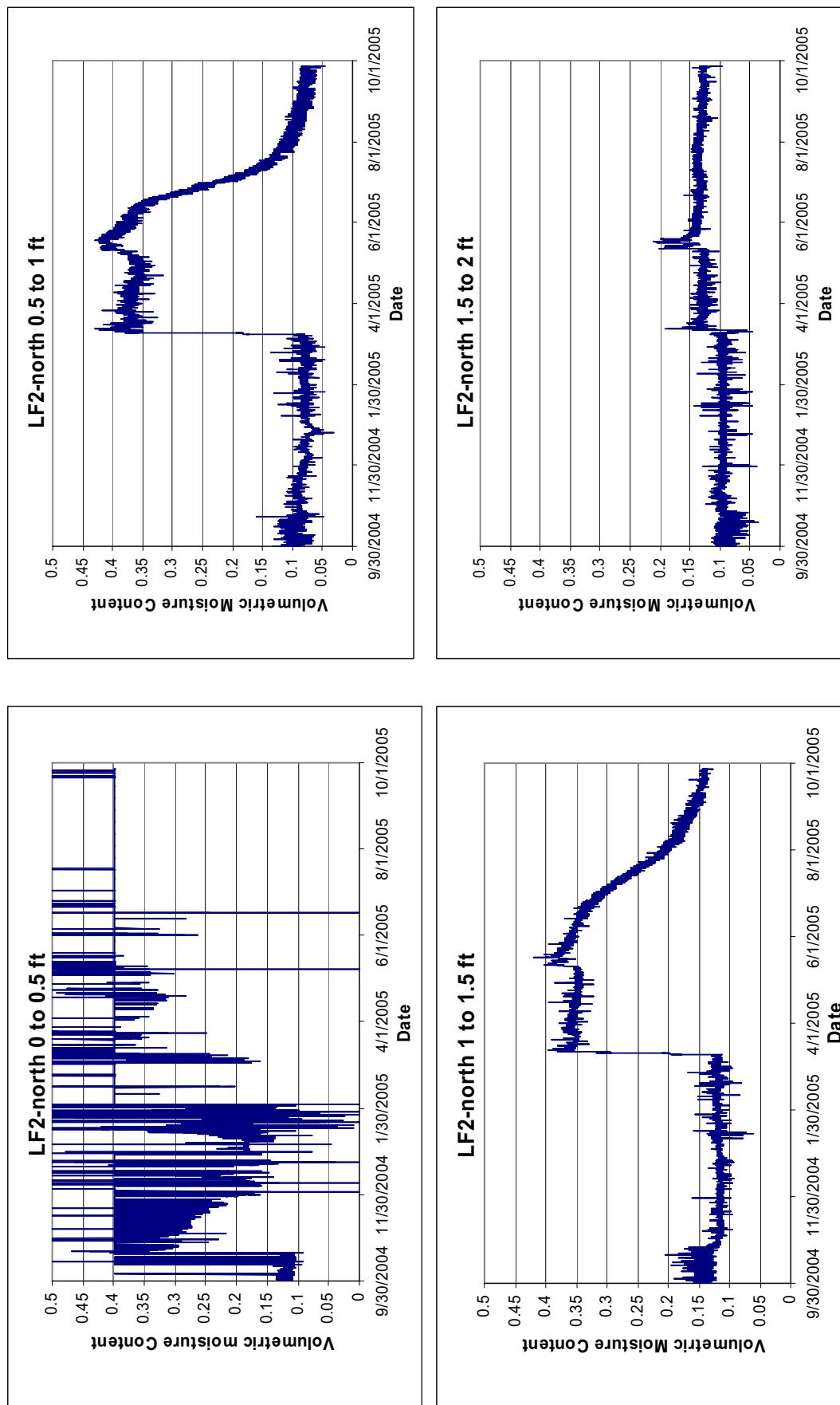


Figure B-1. Time-domain reflectometry moisture data for LF2-north.

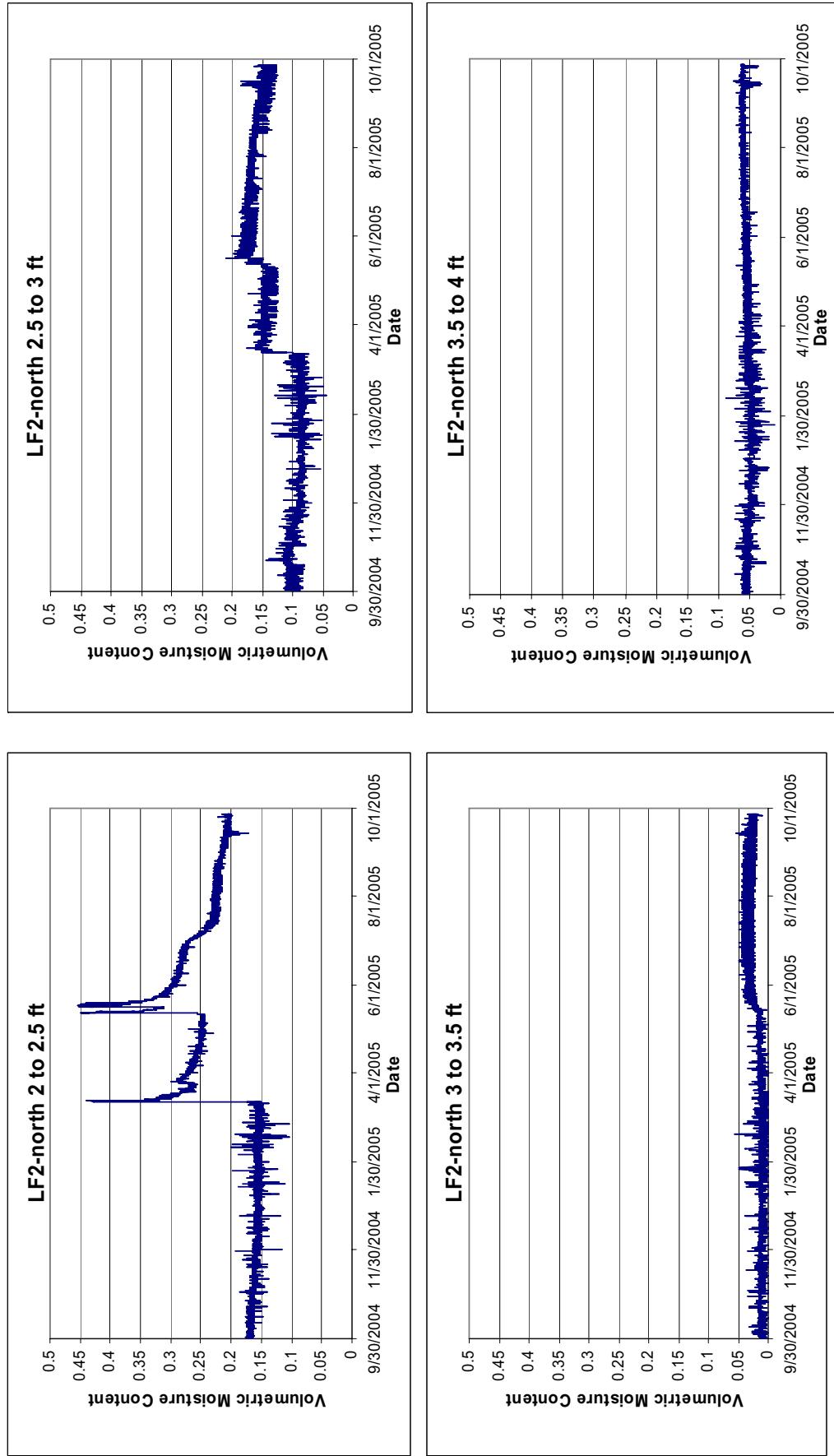


Figure B-1. (continued).

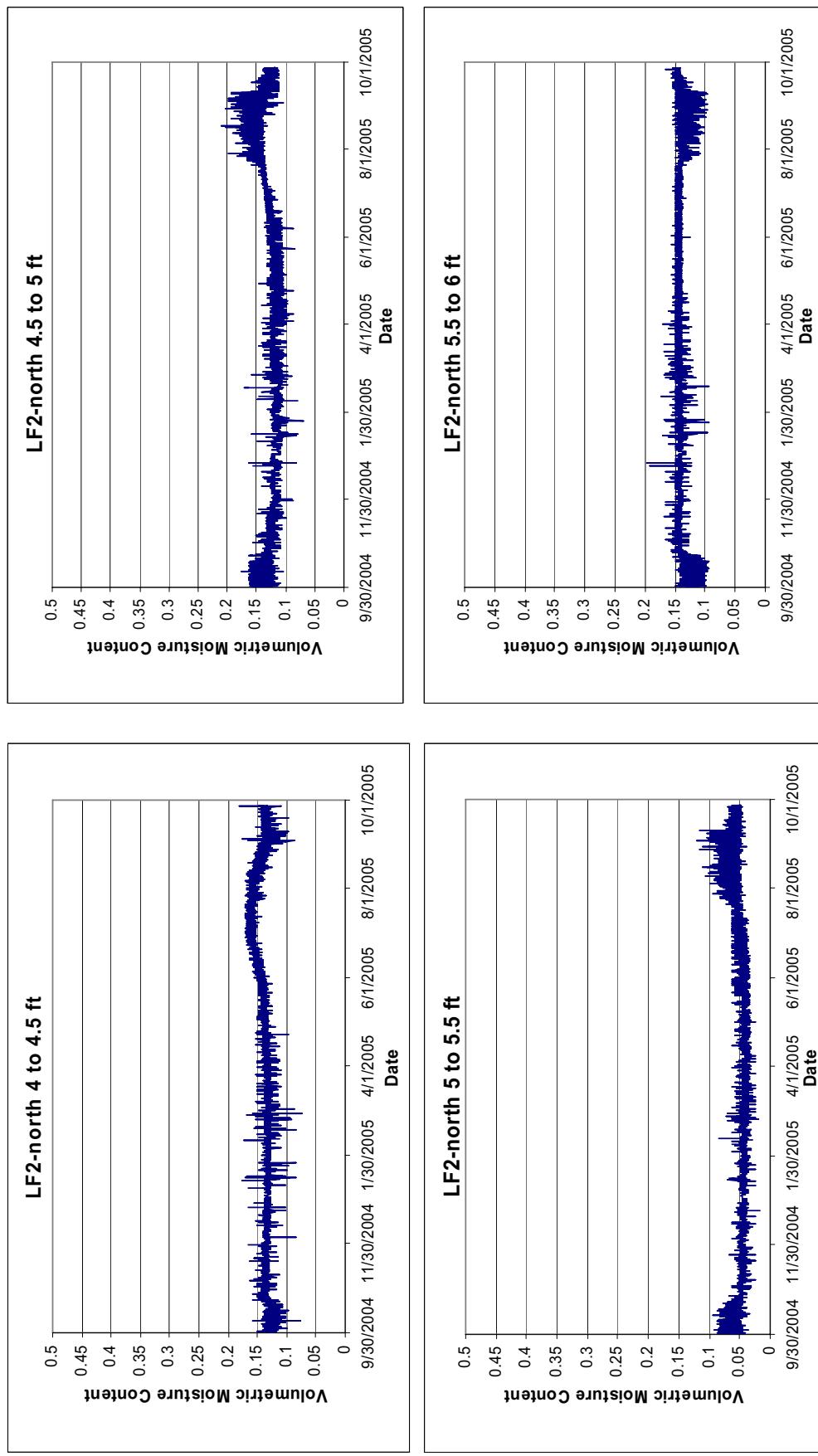


Figure B-1. (continued).

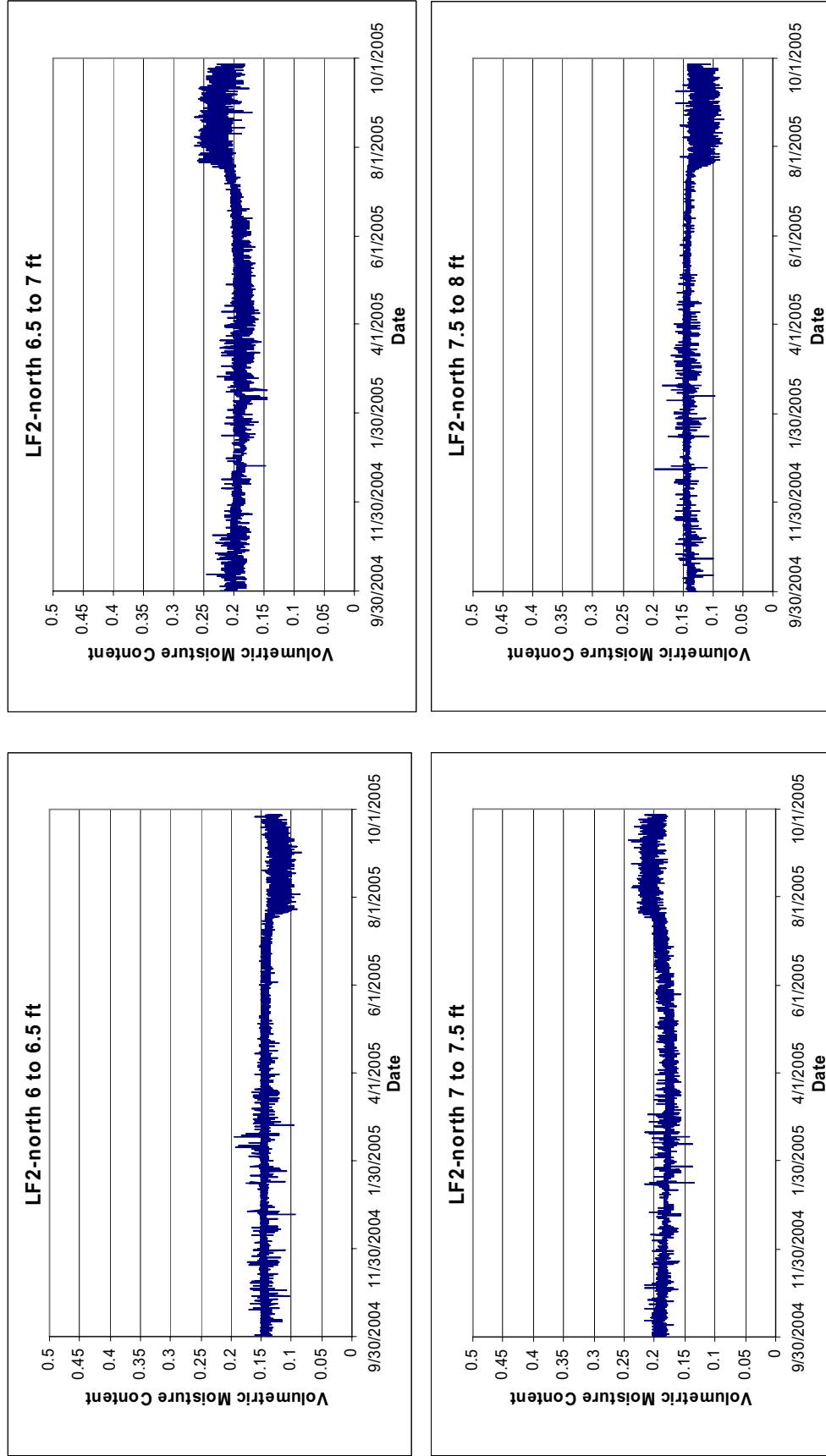


Figure B-1. (continued).

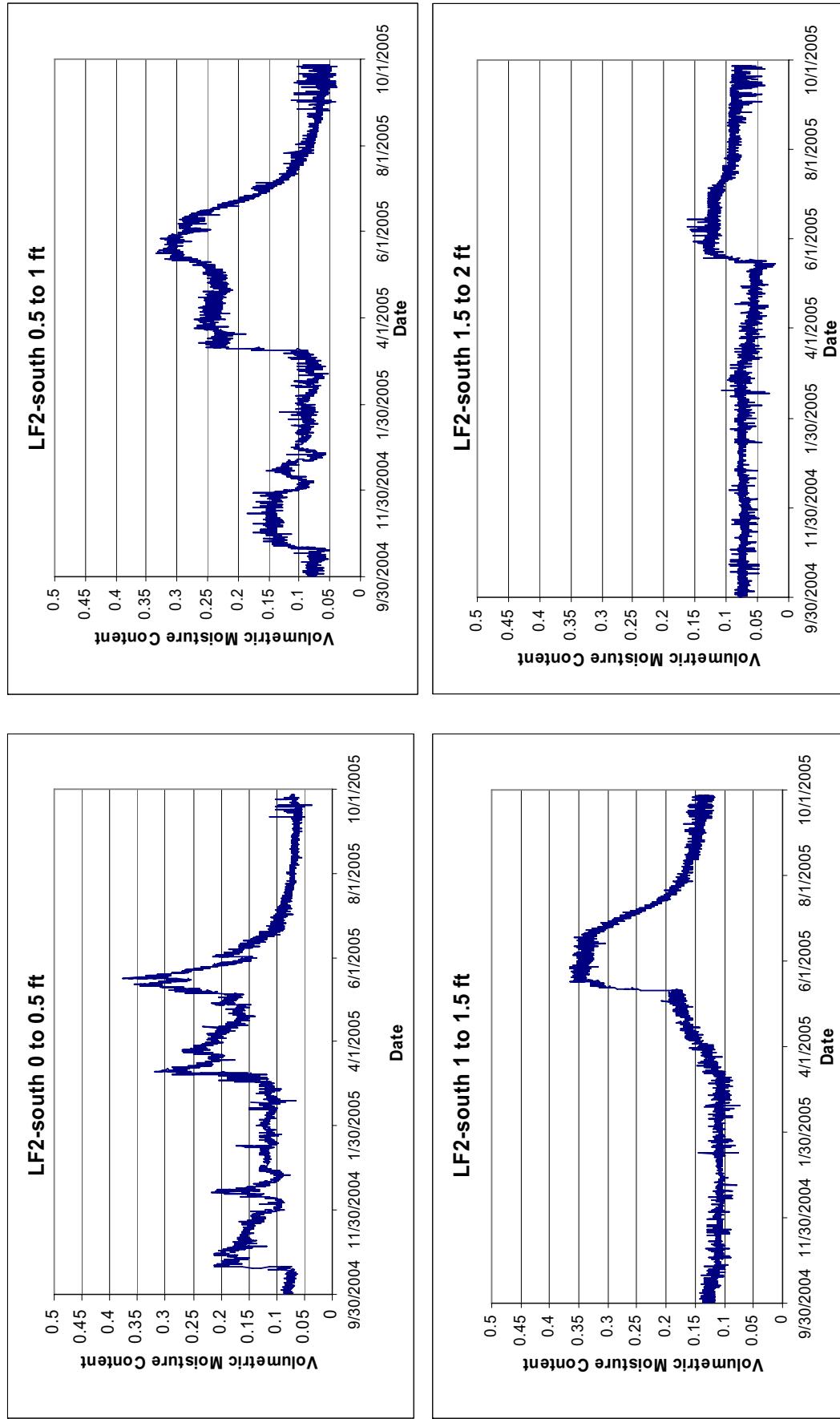


Figure B-2. Time-domain reflectometry moisture data for LF2-south.

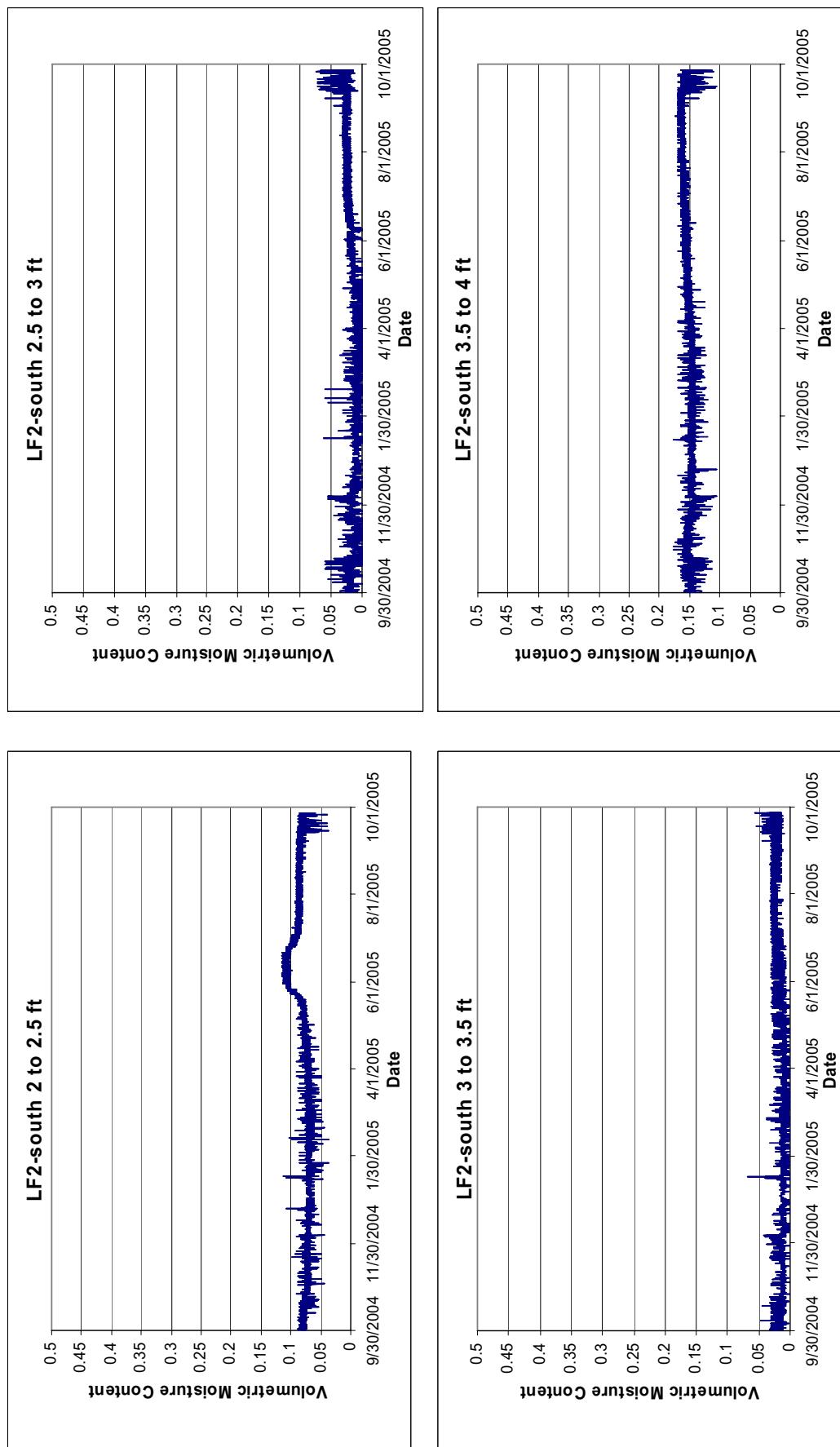


Figure B-2. (continued).

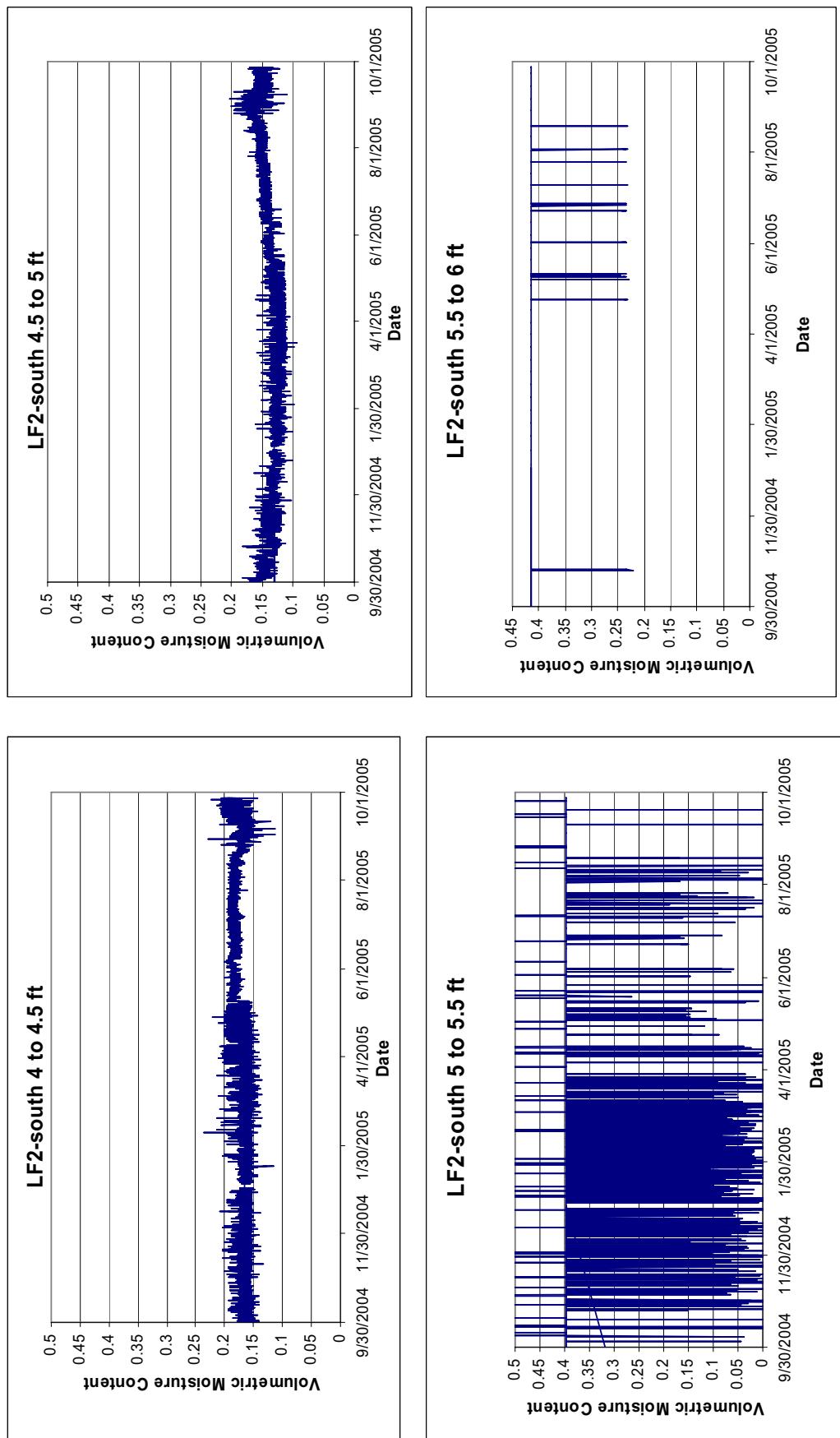


Figure B-2. (continued).

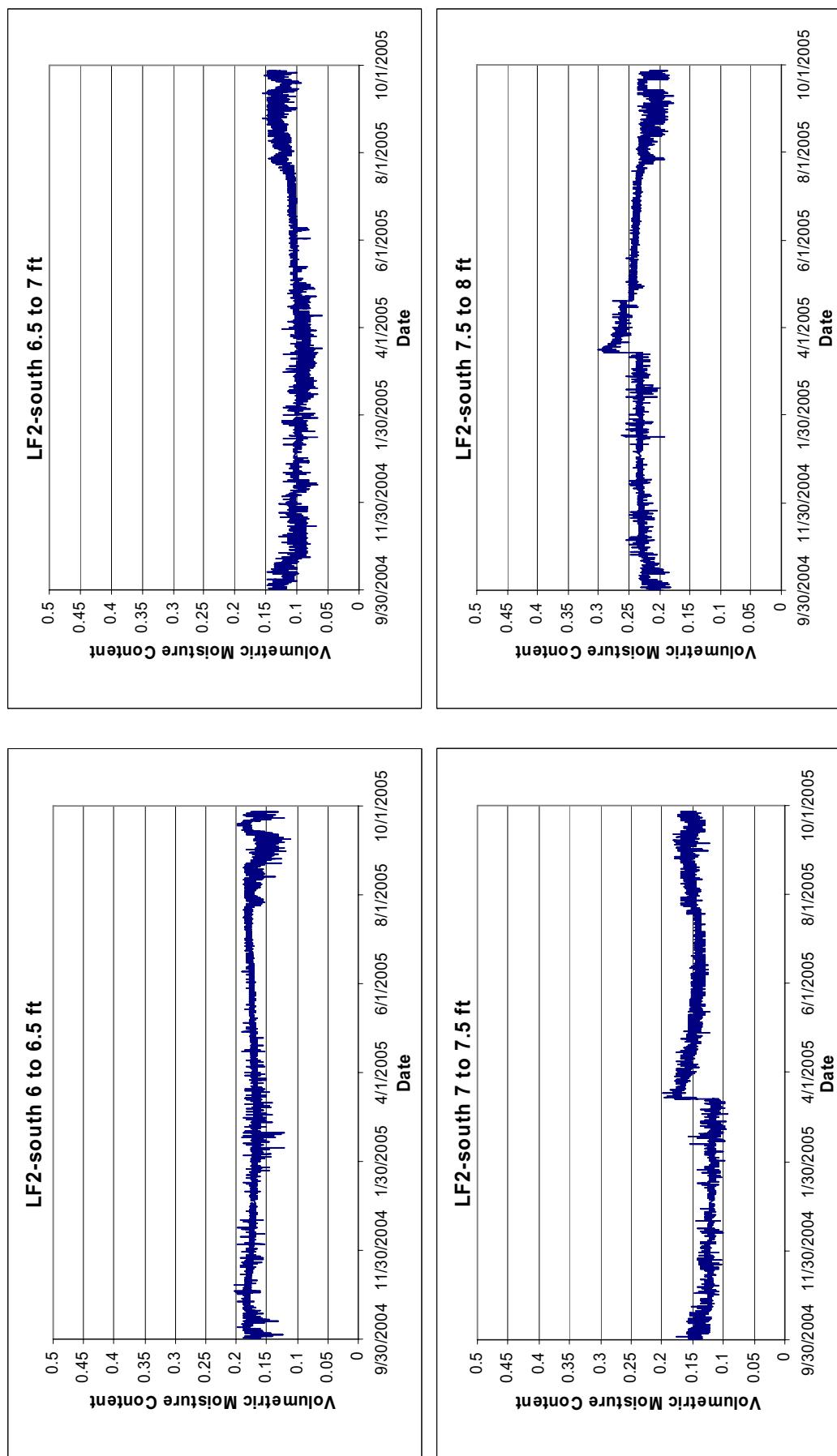


Figure B-2. (continued).

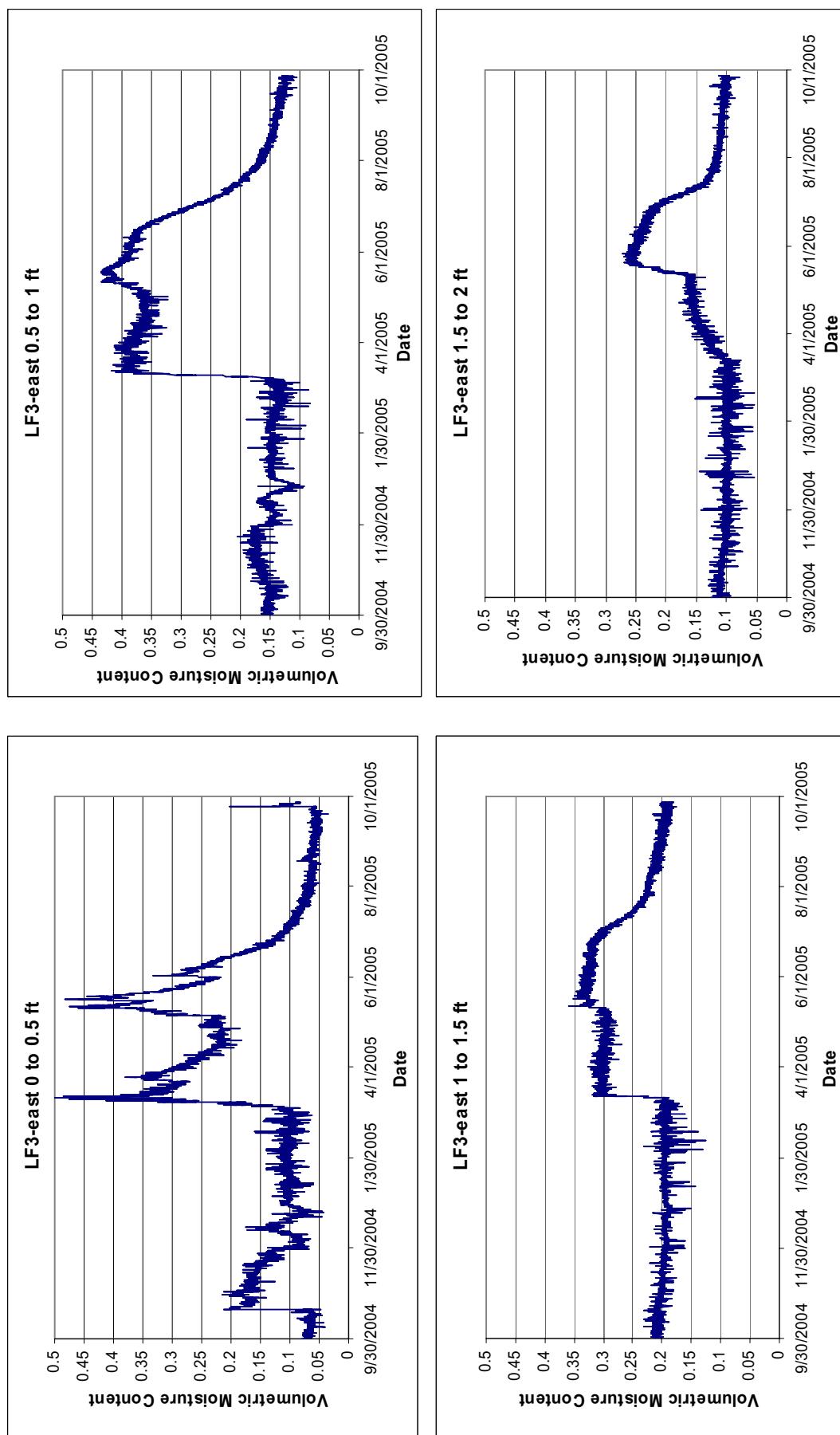


Figure B-3. Time-domain reflectometry moisture data for LF3-east.

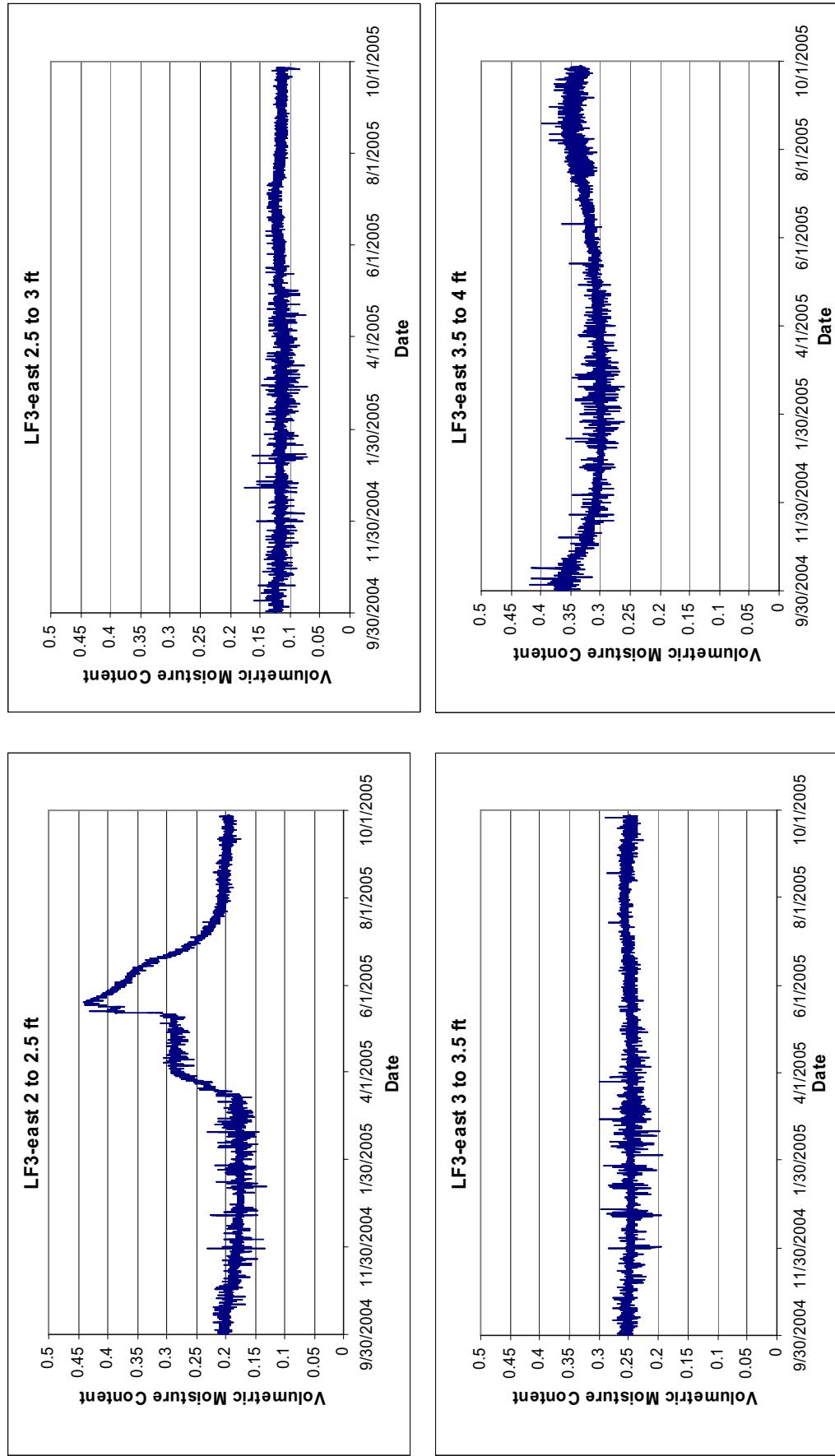


Figure B-3. (continued).

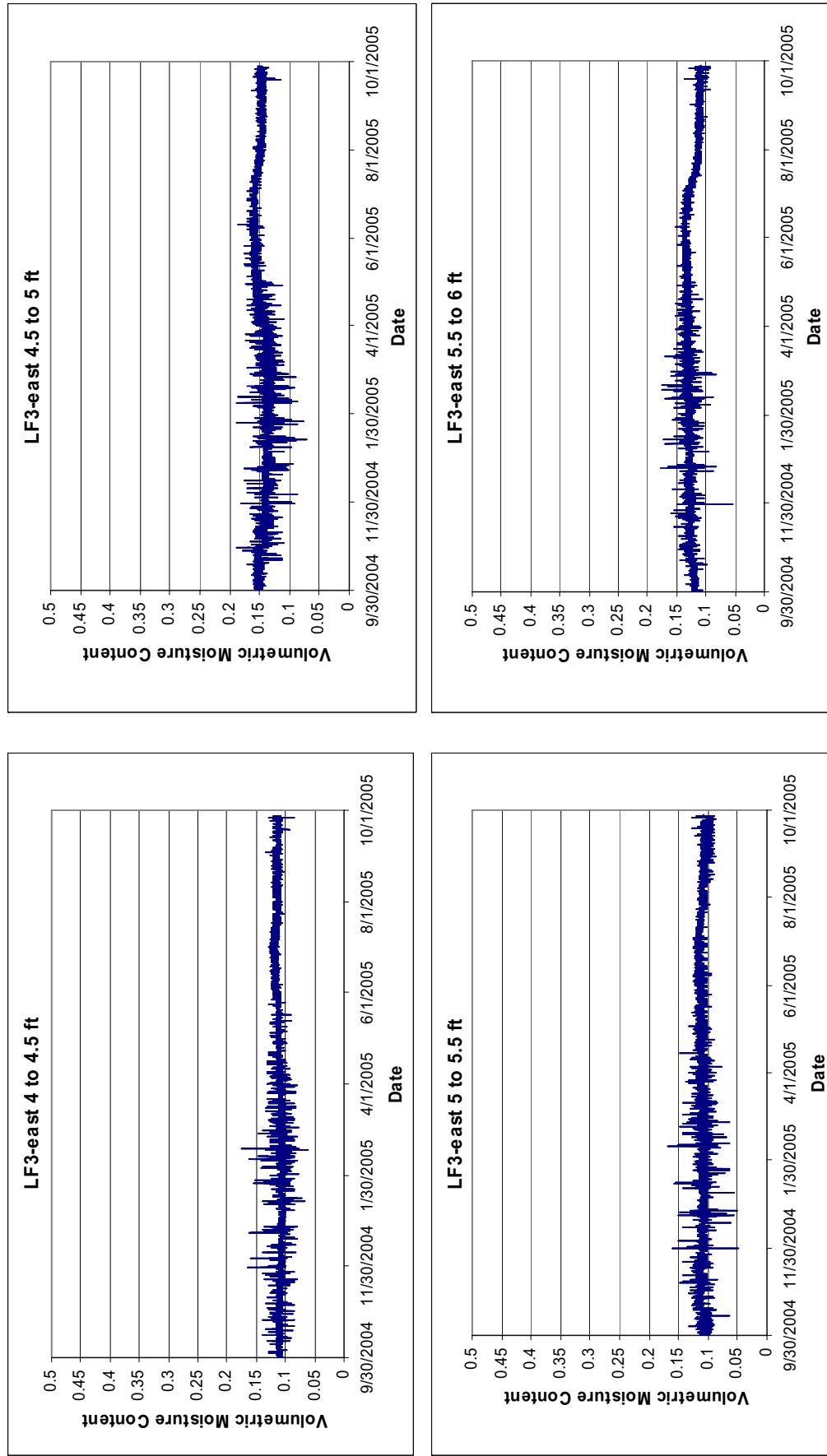


Figure B-3. (continued).

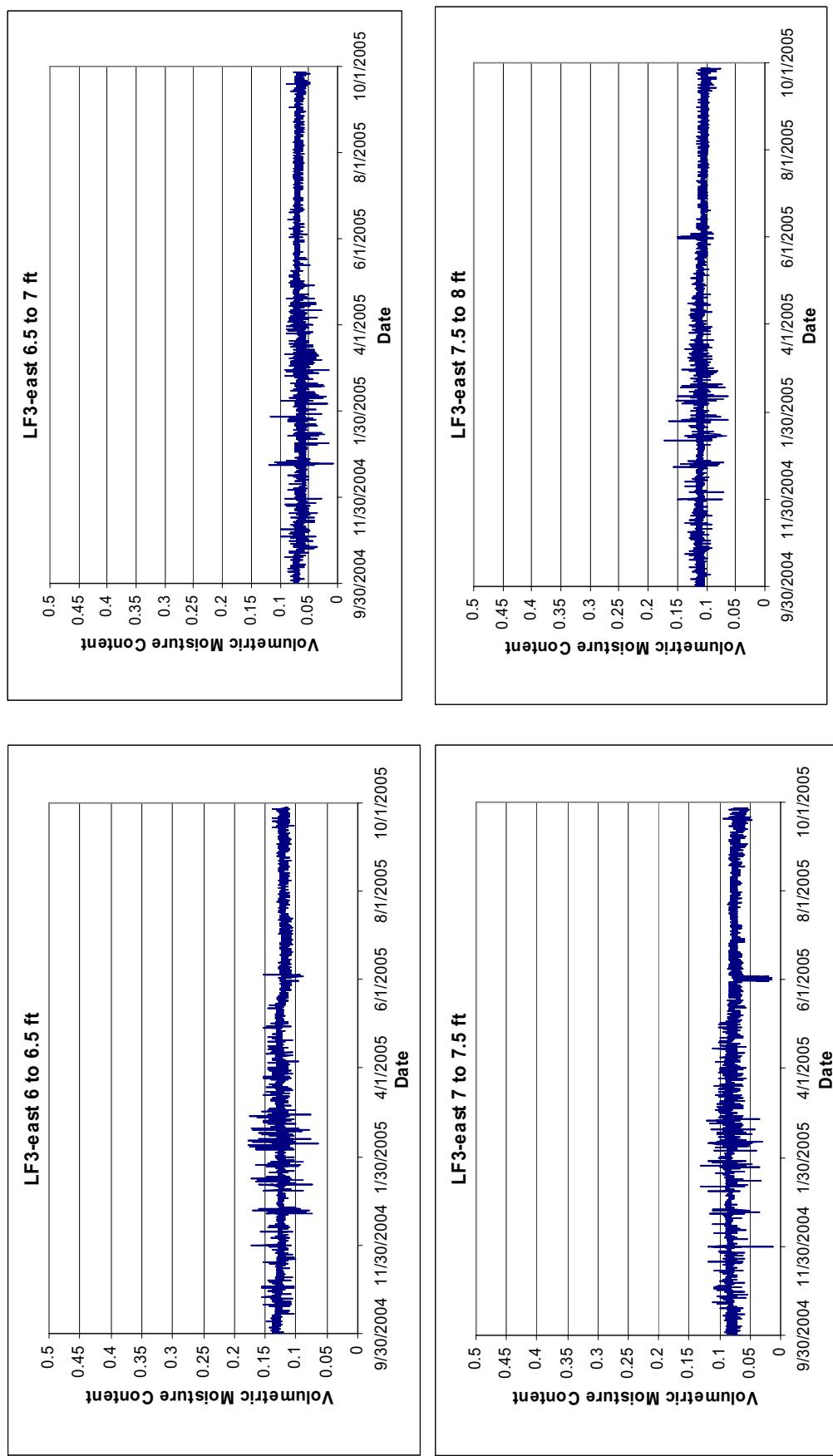


Figure B-3. (continued).

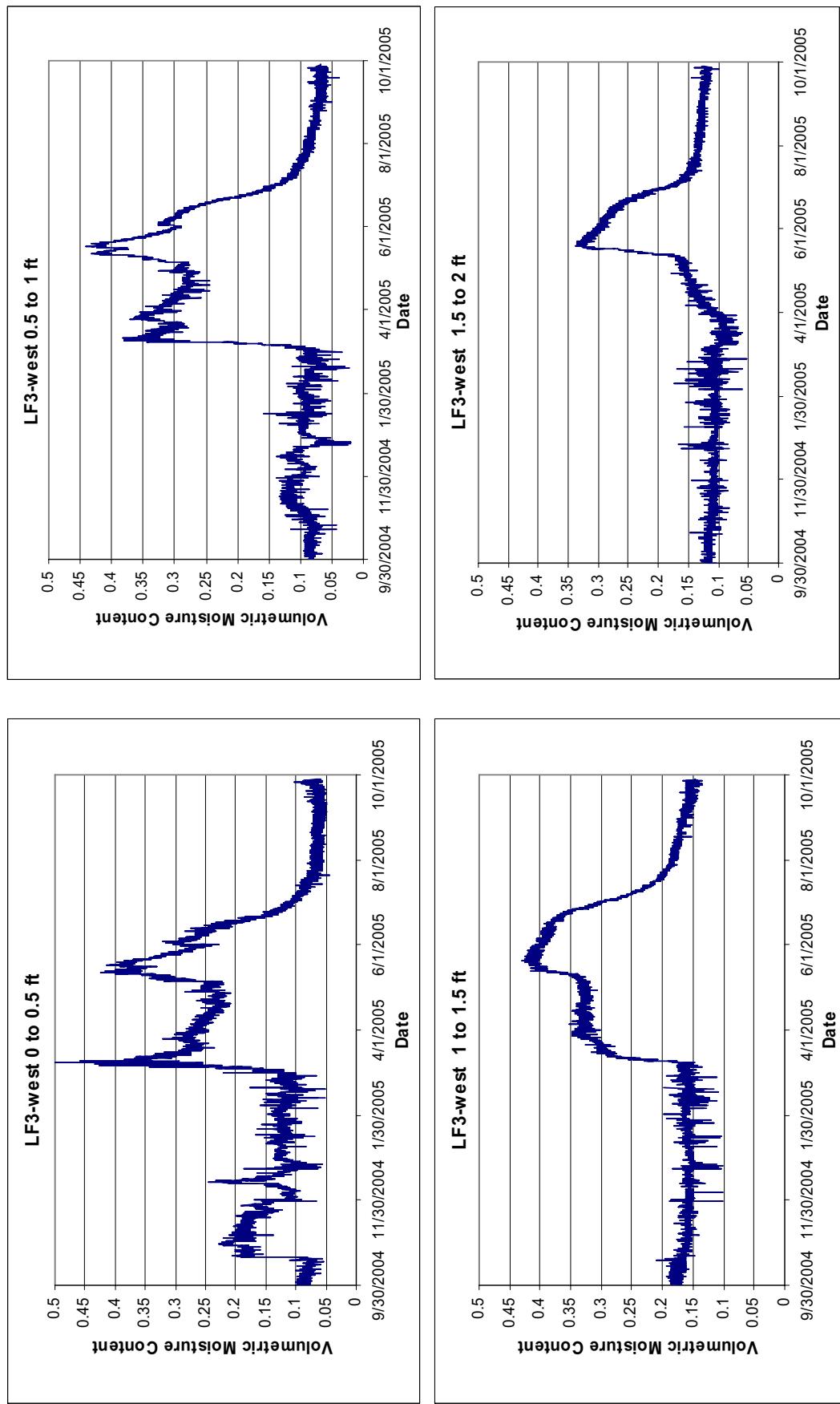


Figure B-4. Time-domain reflectometry moisture data for LF3-west.

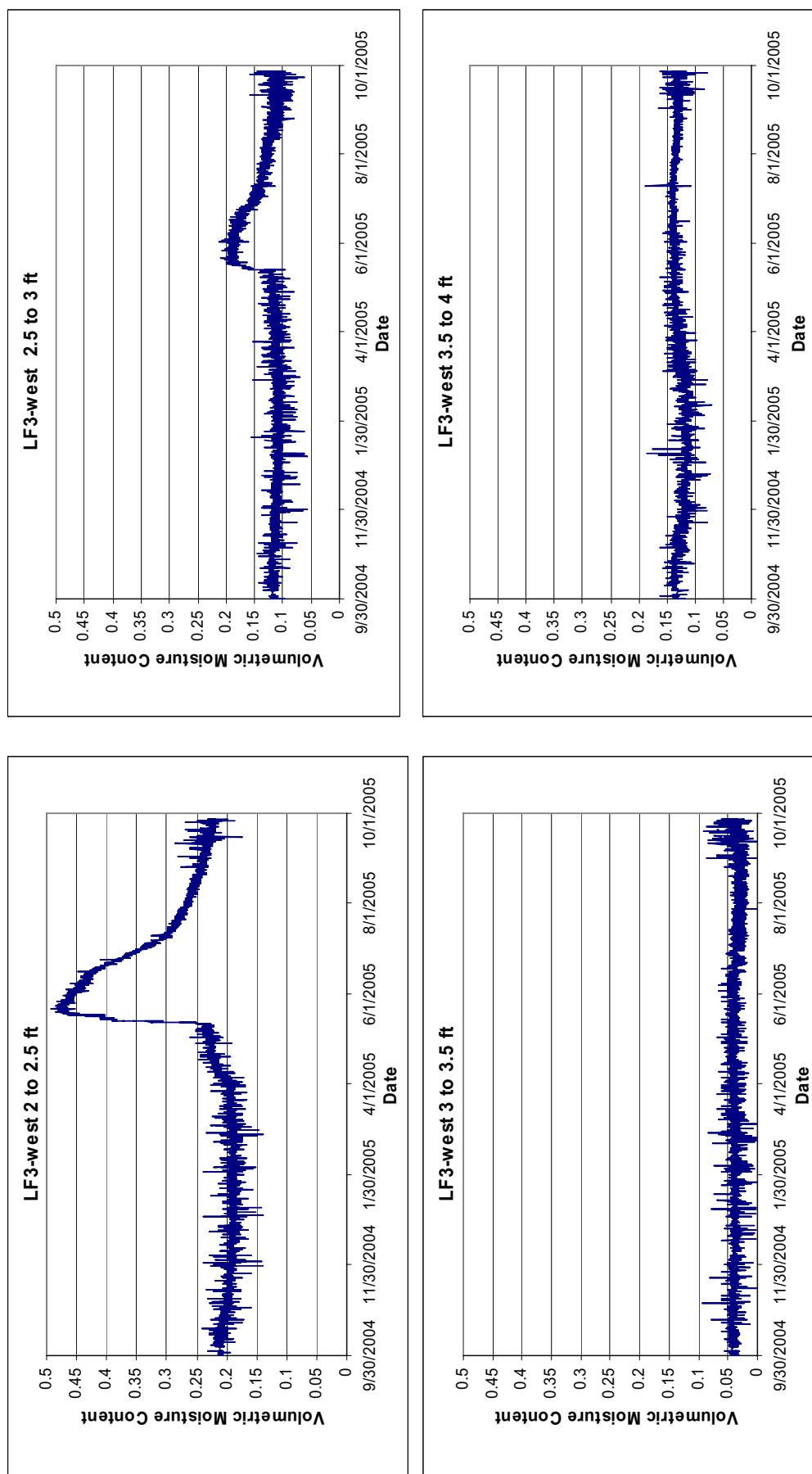


Figure B-4. (continued).

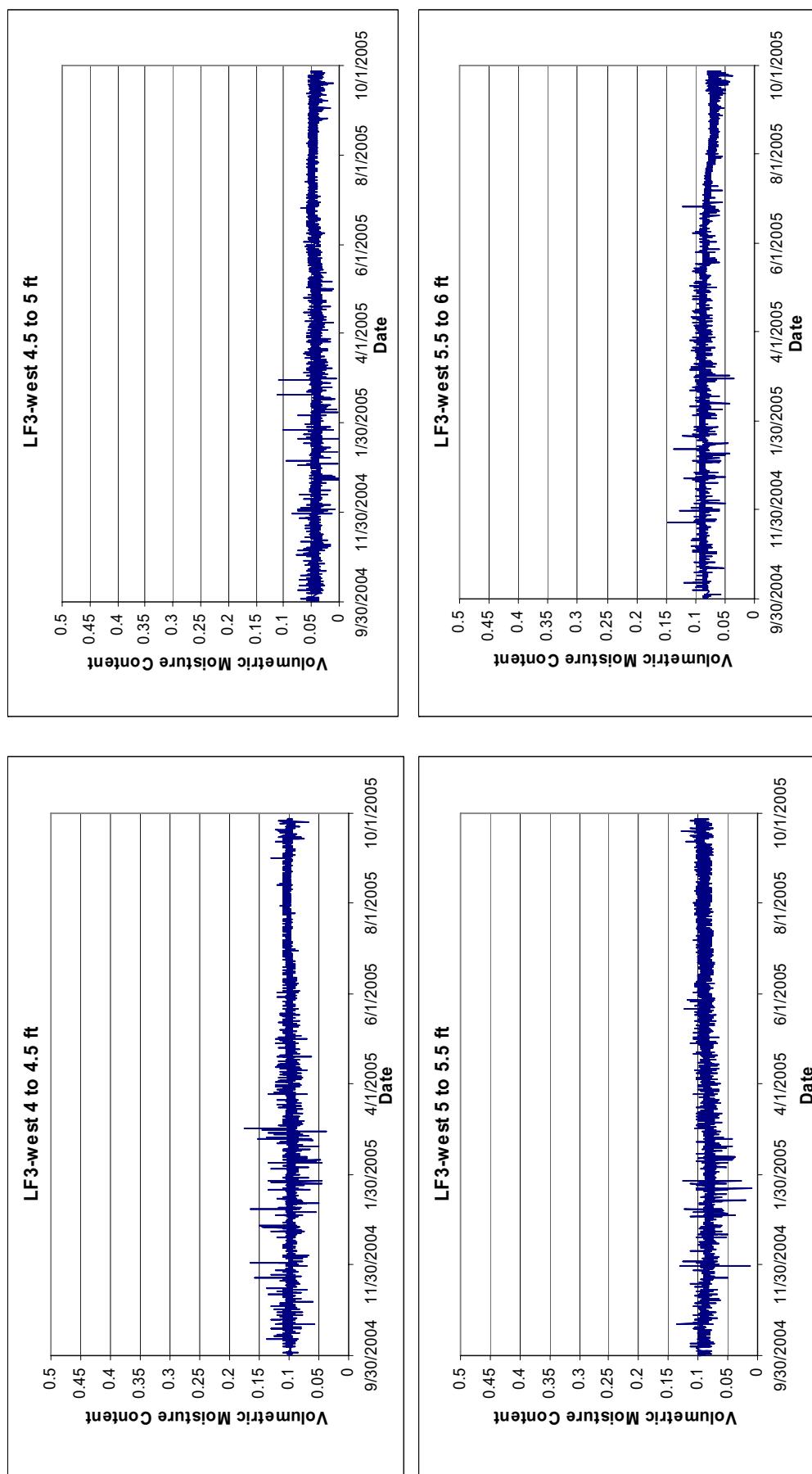


Figure B-4. (continued).

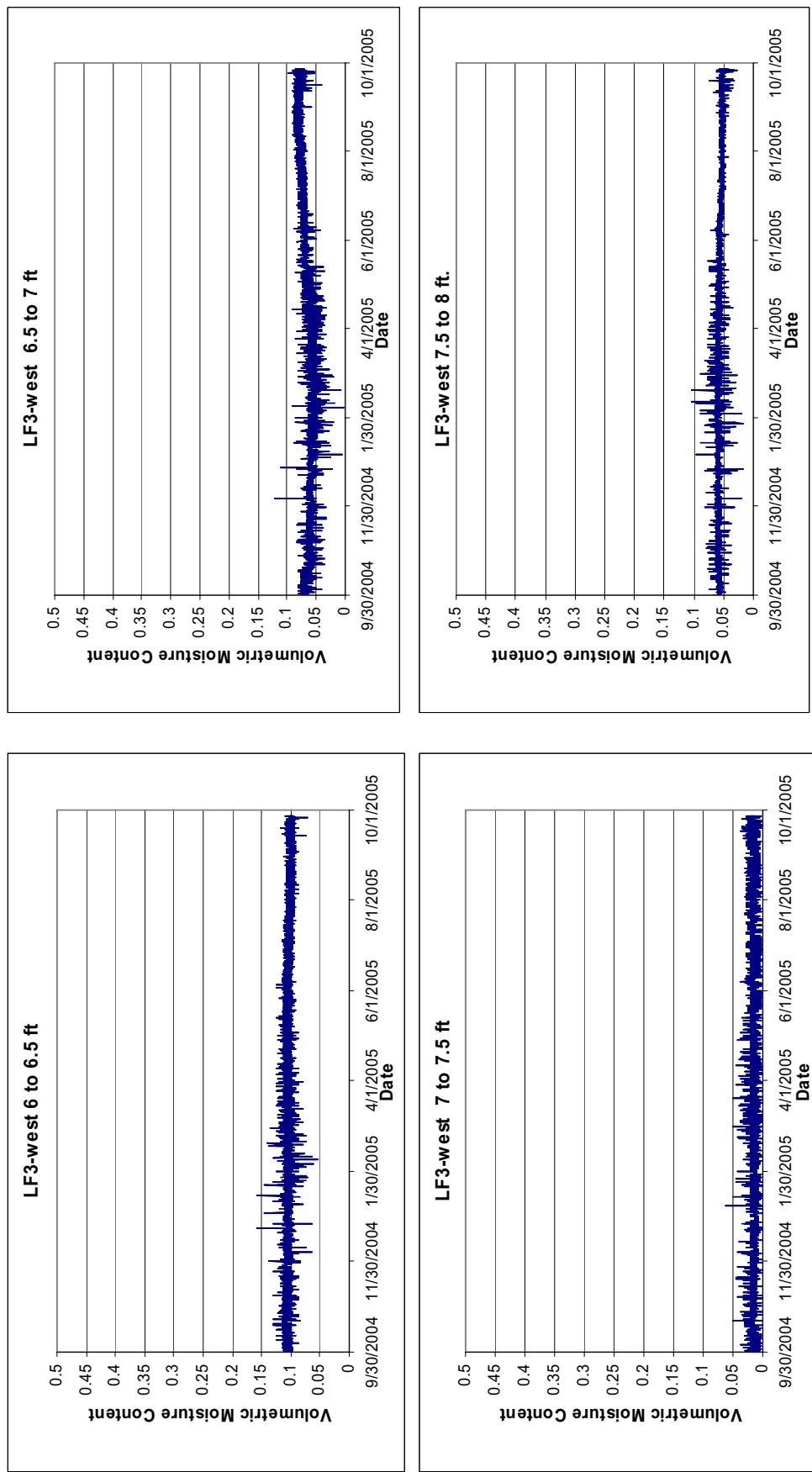


Figure B-4. (continued).

Table B-6. Precipitation summary for Fiscal Year 2005.

Month	Amount (in.)
October	1.38
November	0.01
December	1.07
January	0.55
February	0.05
March	0.68
April	0.8
May	3.56
June	0.79
July	0
August	0.07
September	0.37
Year	9.33
Winter (December 2004 – March 2005)	2.35
Spring (April and May)	4.36

Table B-7. Time-domain reflectometry infiltration and recharge calculations for spring 2005.

LF3-west	Depth (ft)	Infiltration ^a			Drainage		
		Moisture Content		Change in Moisture Content (in.)	Moisture Content		Change in Moisture Content (in.)
		01/30/05	05/25/05	05/25/05	9/27/2005	05/25/05	9/27/2005
0	0	0.5	0.133	0.307	1.05	0.307	0.085
0.5	-	1	0.100	0.347	1.48	0.347	0.083
1	-	1.5	0.163	0.407	1.46	0.407	0.179
1.5	-	2	0.108	0.318	1.26	0.318	0.115
2	-	2.5	0.190	0.470	1.68	0.470	0.209
2.5	-	3	0.109	0.186	0.47	0.186	0.116
3	-	3.5	0.038	0.043	0.03	0.043	0.038
3.5	-	4	0.119	0.137	0.10	0.137	0.01
		Total		7.53			7.53

Recharge—Intervals below 4 ft with an increase in moisture content greater than 2.5 percent.

LF3-east	Depth (ft)	Moisture Content			Moisture Content		
		01/30/05		09/02/05	05/25/05		9/27/2005
		01/30/05	05/25/05	05/25/05	9/27/2005	05/25/05	9/27/2005
0	0	0.5	0.112	0.291	1.07	0.291	0.086
0.5	-	1	0.150	0.403	1.52	0.403	0.126
1	-	1.5	0.195	0.329	0.80	0.329	0.191
1.5	-	2	0.101	0.259	0.95	0.259	0.101
2	-	2.5	0.178	0.408	1.38	0.408	0.196
2.5	-	3	0.116	0.121	0.03	0.121	0.114
3	-	3.5	0.246	0.246	0.00	0.246	0.243
3.5	-	4	0.301	0.312	0.07	0.312	0.340
		Total		4.34		Total	4.67

Recharge—Intervals below 4 ft with an increase in moisture content greater than 2.5 percent.

Depth (ft)	Moisture Content	Moisture Content	
		01/30/04	06/18/04
4.5	-	5	0.137
		0.161	0.14

Table B-7. (continued).

LF2-north	Depth (ft)	Infiltration ^a			Drainage		
		Moisture Content		Change in Moisture Content (in.)	Moisture Content		Change in Moisture Content (in.)
		01/30/05	05/25/05		05/25/05	9/27/2005	
0	—	0.5	—	—	—	—	—
0.5	—	1	0.077	0.394	1.90	0.394	0.081
1	—	1.5	0.120	0.368	1.48	0.368	0.140
1.5	—	2	0.093	0.142	0.29	0.142	0.130
2	—	2.5	0.156	0.312	0.93	0.312	0.206
2.5	—	3	0.086	0.176	0.54	0.176	0.134
3	—	3.5	0.010	0.029	0.11	0.029	0.025
3.5	—	4	0.049	0.056	0.04	0.056	0.060
		Total		5.30	5.30	Total	4.19

LF2-South	Depth (ft)	Infiltration ^a			Drainage		
		Moisture Content		Change in Moisture Content (in.)	Moisture Content		Change in Moisture Content (in.)
		01/30/05	05/25/05		05/25/05	9/27/2005	
0	—	0.5	0.096	0.124	0.17	0.124	0.081
0.5	—	1	0.051	0.142	0.55	0.142	0.080
1	—	1.5	0.090	0.141	0.31	0.141	0.126
1.5	—	2	0.076	0.067	-0.06	0.067	0.074
2	—	2.5	0.070	0.080	0.06	0.080	0.080
2.5	—	3	0.001	0.012	0.07	0.012	0.017
3	—	3.5	0.007	0.016	0.05	0.016	0.019
3.5	—	4	0.145	0.147	0.01	0.147	0.147
		Total		1.16	1.16	Total	0.62

Recharge—Intervals below 4 ft with an increase in moisture content greater than 2.5 percent.

Depth (ft)	Moisture Content	
	01/30/05	08/15/05
6.5	—	7
7	—	7.5

Table B-7. (continued).

Recharge—Intervals below 4 ft with an increase in moisture content greater than 2.5 percent.			
Depth (ft)	Moisture Content		Change in Moisture Content (in.)
	1/30/2005 ^b	09/05/05	
4.5 – 5	0.127	0.167	0.24
6.5 – 7	0.088	0.134	0.28
7 – 7.5	0.140	0.162	0.13
	Total		0.65

a. Soil moisture contents before increase in water contents and peak spring contents.
b. Initial data for June 18 are used for 7- to 7.5-ft segment because of spike that occurred on March 20, 2005.

Table B-8. Depth of wetting front or water penetration from spring 2005 and recharge evaluation.

Location	Depth (ft)	Moisture Content Change > 2.5%		Peak Change in Moisture Content ^a	Moisture Content Increase Below 4 ft	Location	Depth (ft)	Moisture Content Change > 2.5%	Peak Change in Moisture Content ^a	Moisture Content Increase Below 4 ft
		Moisture	Content Change							
LF2-north	0 – 0.5	—	—	5/22/2005	5/22/2005	LF2-south	0 – 0.5	Yes	5/17/2005	
	0.5 – 1	Yes	Yes	5/22/2005	5/22/2005		0.5 – 1	Yes	5/19/2005	
	1 – 1.5	Yes	Yes	5/22/2005	5/22/2005		1 – 1.5	Yes	5/27/2005	
	1.5 – 2	Yes	Yes	5/22/2005	5/22/2005		1.5 – 2	Yes	5/31/2005	
	2 – 2.5	Yes	Yes	5/20/2005	5/20/2005		2 – 2.5	Yes	6/9/2005	
	2.5 – 3	Yes	Yes	5/26/2005	5/26/2005		2.5 – 3	Yes	7/12/2005	
	3 – 3.5	Yes	Yes	6/30/2005	6/30/2005		3 – 3.5	No	NA	
	3.5 – 4	No	NA	NA	NA		3.5 – 4	No	NA	
	4 – 4.5	Yes	Yes	7/8/2005	—		4 – 4.5	No	NA	—
	4.5 – 5	Yes	Yes	8/28/2005	—		4.5 – 5	Yes	9/5/2005	0.242
	5 – 5.5	No	NA	NA	—		5 – 5.5	—	—	—
	5.5 – 6	No	NA	NA	—		5.5 – 6	—	—	—
	6 – 6.5	Yes	Yes	8/15/2005	0.234		6 – 6.5	No	NA	
	6.5 – 7	Yes	Yes	8/15/2005	0.204		6.5 – 7	Yes	9/5/2005	0.278
	7 – 7.5	No	NA	—	—		7 – 7.5	Yes	9/5/2005	0.132
	7.5 – 8	No	NA	—	—		7.5 – 8	—	—	*
LF3-east	0 – 0.5	Yes	Yes	3/12, 5/12/05	5/20/2005	LF3-west	0 – 0.5	Yes	5/20/2005	
	0.5 – 1	Yes	Yes	5/24/2005	5/24/2005		0.5 – 1	Yes	5/24/2005	
	1 – 1.5	Yes	Yes	5/29/2005	5/29/2005		1 – 1.5	Yes	5/24/2005	
	1.5 – 2	Yes	Yes	5/22/2005	5/22/2005		1.5 – 2	Yes	5/24/2005	
	2 – 2.5	Yes	Yes	NA	NA		2 – 2.5	Yes	5/26/2005	
	2.5 – 3	No	NA	NA	NA		2.5 – 3	Yes	5/25/2005	
	3 – 3.5	No	NA	NA	NA		3 – 3.5	No	NA	
	3.5 – 4	Yes ⁽³⁾	Yes ⁽³⁾	8/24/2005 ⁽³⁾	—		3.5 – 4	Yes	6/14/2005	
	4 – 4.5	No	NA	—	—		4 – 4.5	No	NA	—
	4.5 – 5	Yes	Yes	6/18/2005	0.140		4.5 – 5	No	NA	—
	5 – 5.5	No	NA	—	—		5 – 5.5	No	NA	—
	5.5 – 6	No	NA	—	—		5.5 – 6	No	NA	—
	6 – 6.5	No	NA	—	—		6 – 6.5	No	NA	—
	6.5 – 7	No	NA	—	—		6.5 – 7	yes	9/2/2005	0.15
	7 – 7.5	No	NA	—	—		7 – 7.5	No	NA	—
	7.5 – 8	No	NA	—	—		7.5 – 8	No	NA	—

a. Spring snowmelt started near the date of March 3. Peak change in moisture content dates are approximate.

b. The apparent increase in moisture is questionable because of a significant increase in instrument noise (see text for additional explanation).

NA = not applicable.

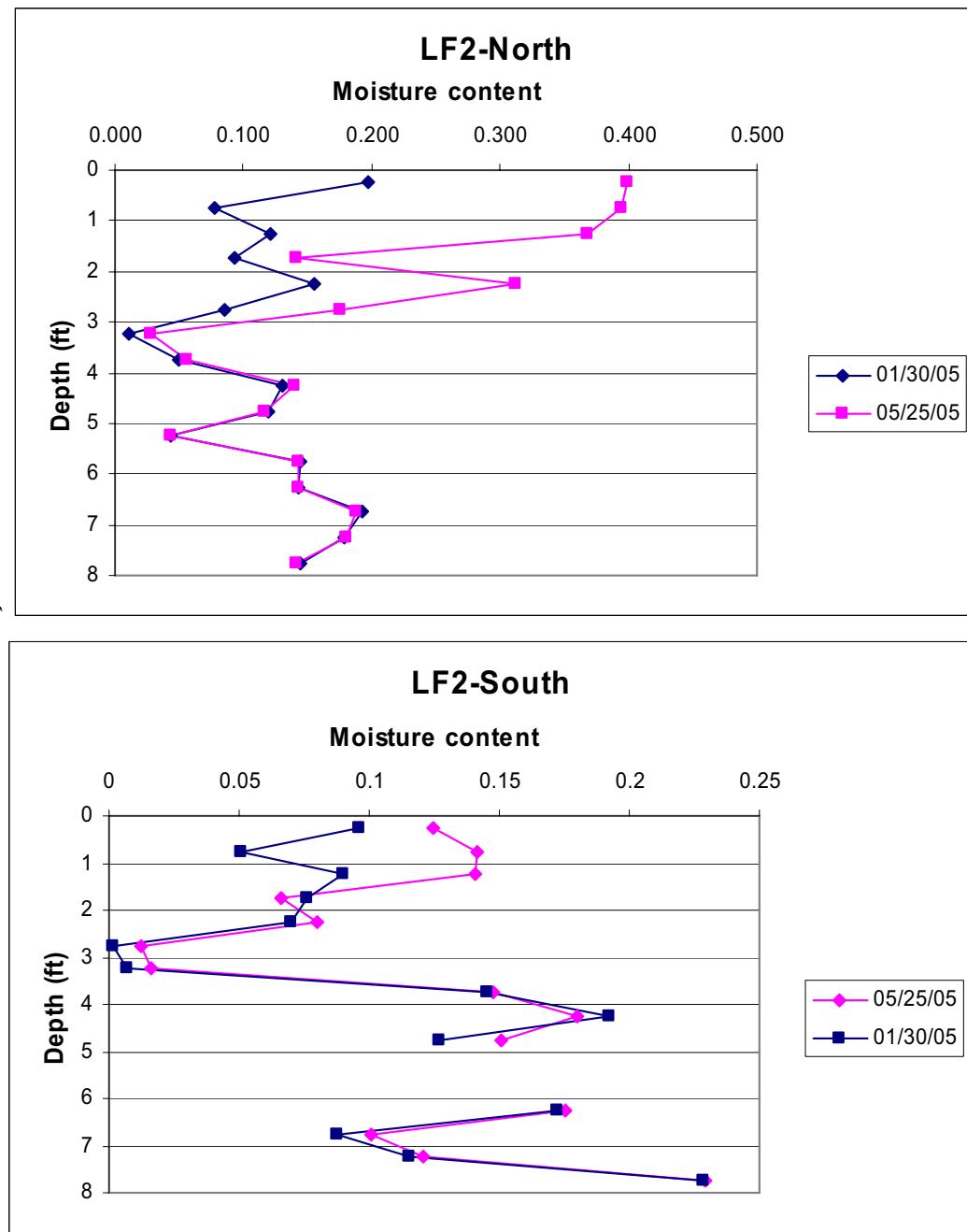


Figure B-5. Moisture profiles for Landfill II time-domain reflectometers.

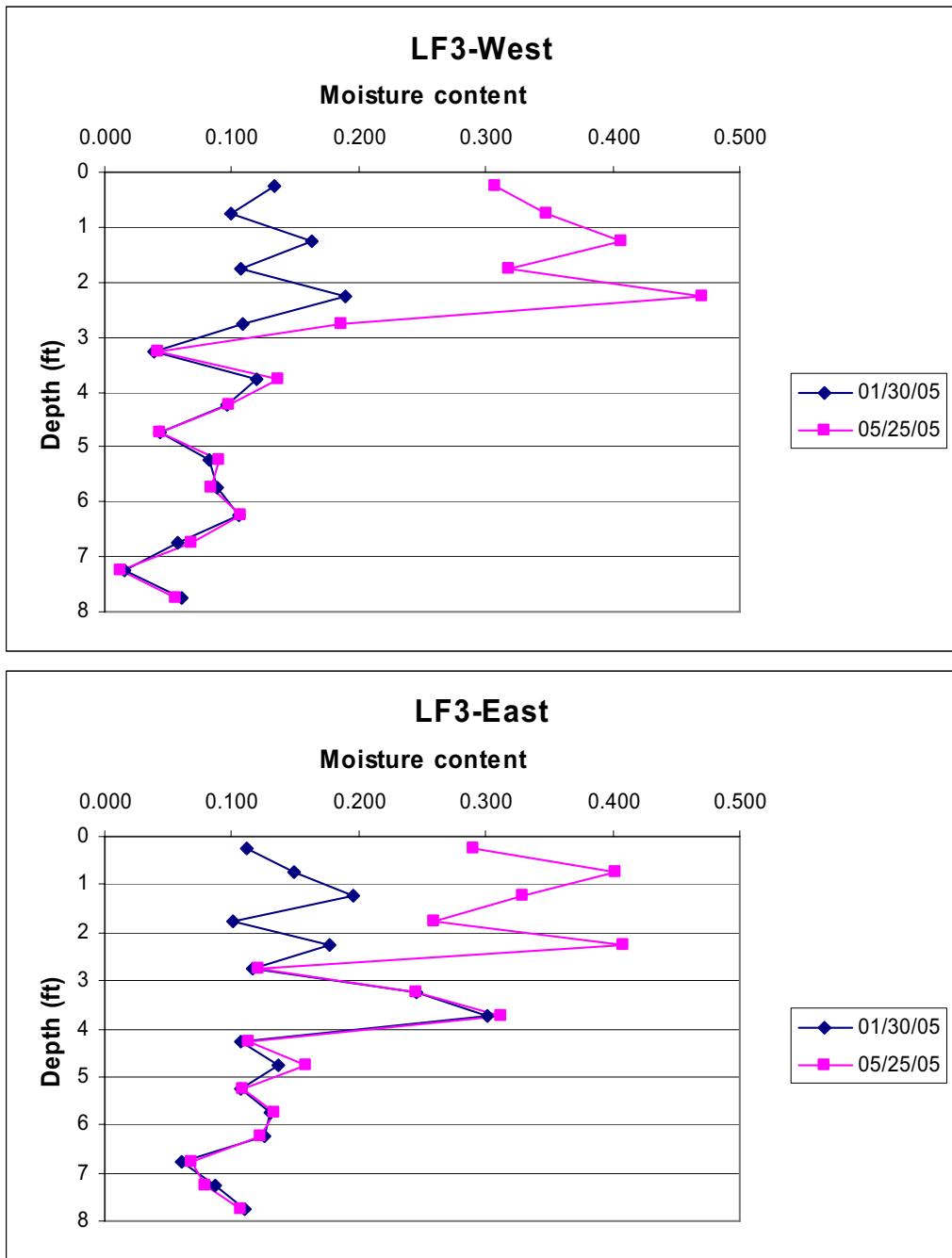


Figure B-6. Moisture profiles for Landfill III time-domain reflectometers.

Table B-9. Water balance for time-domain reflectometry arrays.

Location	Change in Water Content ^(a)						Change in Water Content ^(a)						
	LF2-north	Sep-04	Sep-05	0-8 ft	4-8 ft	0-2 ft	LF2-south	Sep-04	Sep-05	0-8 ft	4-8 ft	0-2 ft	
0 - 0.5	0.123	—	—	—	—	—	0	—	0.5	0.081	0.070	-0.066	
0.5 - 1	0.092	0.081	-0.068	-0.068	0.068	-0.068	0.5	—	1	0.080	0.065	-0.091	
1 - 1.5	0.142	0.140	-0.012	-0.012	-0.012	-0.012	1	—	1.5	0.126	0.137	0.065	
1.5 - 2	0.094	0.130	0.219	0.219	0.219	0.219	1.5	—	2	0.074	0.068	-0.038	
2 - 2.5	0.169	0.206	0.221	0.221	0.221	0.221	2	—	2.5	0.080	0.076	-0.026	
2.5 - 3	0.101	0.134	0.196	0.196	0.196	0.196	2.5	—	3	0.017	0.035	0.108	
3 - 3.5	0.012	0.025	0.077	0.077	0.077	0.077	3	—	3.5	0.019	0.031	0.067	
3.5 - 4	0.057	0.060	0.021	0.021	0.021	0.021	3.5	—	4	0.147	0.147	-0.003	
4 - 4.5	0.124	0.146	0.134	0.134	0.134	0.134	4	—	4.5	0.161	0.192	0.183	
4.5 - 5	0.161	0.125	-0.216	-0.216	-0.216	-0.216	4.5	—	5	0.161	0.158	-0.021	
5 - 5.5	0.078	0.050	-0.166	-0.166	-0.166	-0.166	5	—	5.5	—	—	—	
5.5 - 6	0.110	0.149	0.231	0.231	0.231	0.231	5.5	—	6	—	—	—	
6 - 6.5	0.143	0.128	-0.091	-0.091	-0.091	-0.091	6	—	6.5	0.168	0.150	-0.106	
6.5 - 7	0.204	0.215	0.065	0.065	0.065	0.065	6.5	—	7	0.130	0.136	0.035	
7 - 7.5	0.190	0.199	0.052	0.052	0.052	0.052	7	—	7.5	0.147	0.161	0.080	
7.5 - 8	0.138	0.121	-0.100	-0.100	-0.100	-0.100	7.5	—	8	0.208	0.201	-0.043	
Totals		0.56	-0.09	0.14						Totals	0.14	0.13	-0.13

Location	Change in Water Content ^(a)						Change in Water Content ^(a)					
	LF3-east	Sep-04	Sep-05	0-8 ft	4-8 ft	0-2 ft	LF3-west	Sep-04	Sep-05	0-8 ft	4-8 ft	0-2 ft
0 - 0.5	0.069	0.086	0.107	0.107	0.107	0.107	0	—	0.5	0.069	0.085	0.100
0.5 - 1	0.155	0.126	-0.174	-0.174	-0.174	-0.174	0.5	—	1	0.067	0.083	0.097
1 - 1.5	0.210	0.191	-0.113	-0.113	-0.113	-0.113	1	—	1.5	0.148	0.179	0.183
1.5 - 2	0.110	0.101	-0.058	-0.058	-0.058	-0.058	1.5	—	2	0.120	0.115	-0.029
2 - 2.5	0.203	0.196	-0.044				2	—	2.5	0.223	0.209	-0.082

Table B-9. (continued).

Location	LF3-east	Change in Water Content ^(a)			LF3-west	Sep-04	Sep-05	Sep-06	Sep-07	Sep-08	Sep-09	Sep-05	Sep-06	Sep-07	Sep-08	Sep-09	Change in Water Content ^(a)	
		0-8 ft	4-8 ft	0-2 ft														
2.5	-	3	0.122	0.114	-0.046								2.5	-	3	0.112	0.116	0.028
3	-	3.5	0.254	0.243	-0.065								3	-	3.5	0.046	0.038	-0.051
3.5	-	4	0.361	0.340	-0.127								3.5	-	4	0.127	0.134	0.044
4	-	4.5	0.110	0.114	0.024	0.024							4	-	4.5	0.100	0.099	-0.008
4.5	-	5	0.153	0.147	-0.033	-0.033							4.5	-	5	0.037	0.047	0.063
5	-	5.5	0.103	0.101	-0.029	-0.029							5	-	5.5	0.096	0.090	-0.037
5.5	-	6	0.120	0.109	-0.063	-0.063							5.5	-	6	0.067	0.081	0.084
6	-	6.5	0.135	0.121	-0.080	-0.080							6	-	6.5	0.099	0.105	-0.041
6.5	-	7	0.071	0.062	-0.055	-0.055							6.5	-	7	0.079	0.071	-0.047
7	-	7.5	0.083	0.064	-0.113	-0.113							7	-	7.5	0.020	0.011	-0.053
7.5	-	8	0.110	0.102	-0.052	-0.052							7.5	-	8	0.050	0.056	-0.038
		Totals			-0.92	-0.40	-0.24						Totals			0.37	-0.08	0.35

a. Change in water content is equal to change in moisture content multiplied by the 6-in. length of each TDR segment.

Appendix C

Landfill Cover Modeling

Appendix C

Landfill Cover Modeling

C-1. INTRODUCTION

This appendix presents the results of a study aimed at using water content monitoring data from the Central Facilities Area (CFA) landfills as a means of calibrating an unsaturated flow model of the CFA landfills and thereby improving current understanding of water movement through the landfill covers. Previous analyses of moisture monitoring data suggested that because changes in soil moisture storage generally were limited to the upper several meters of soil, no significant recharge was occurring below that depth. That conclusion was based largely on the assumption that downward water fluxes at the depths where water content is essentially constant are insignificant. This study attempts to quantify the flux that might result from temporal redistribution of observed changes in storage to a slow, nearly steady recharge in order to test that assumption. Accordingly, this study used local meteorological data to (a) define the potential for surface infiltration, evaporation, and transpiration at the site; (b) solve the one-dimensional nonlinear equations for redistribution of surface infiltration into the vadose zone using the Hydrus 1D program; and (c) tune the model to specific subsurface conditions at several monitoring locations in order to calculate how water at each location is distributed between infiltration, evaporation, transpiration, and recharge, which is defined here as net annual percolation below the root zone.

C-1.1 Background

The processes that describe water movement into and out of the near-surface vadose zone include infiltration, evaporation, transpiration, and recharge. Infiltration is the flux of water across the soil surface, which may be positive (downward) or negative (upward), depending on the relative dominance of available water inputs versus potential evaporation rate. Below the surface, water may be directly removed only via root uptake (transpiration), so water that is not removed via root uptake and that is not pulled upward to the surface via evaporation will ultimately percolate to depth and recharge the underlying groundwater system.

Infiltration events in the subsurface generally are characterized by temporary increases in soil moisture storage, as conditions adjust to accommodate the influx of water and conduct some of it to the underlying soil. These changes in storage tend to decrease with increasing depth for two very different reasons. Where plants remove water from the subsurface, they may remove most of the water that enters the soil during an infiltration event and infiltration may never penetrate past the bottom of the root zone. In the absence of roots and transpiration effects, moisture content variations decrease with depth because water transmission is successively spread over longer times by the changes in hydraulic conductivity and pressure gradients that accompany changes in storage. In contrast to the former case, however, this damping does not reflect a change in the net flux through the system, only a change in the timing of its transmission. While the two processes do lead to different damping behavior, it is difficult to distinguish their independent effects because of the complicated relationship between water movement and water content in unsaturated conditions. The problem this presents to interpretation of water content monitoring data is that changes in soil moisture storage, and the depth at which they are effectively eliminated, do not provide a simple means of determining recharge flux the system.

One method of estimating recharge that does not require an analysis of changes in soil moisture storage is to use Darcy's law to estimate the flux at a depth below that at which changes in storage are felt. At that point, natural minimization of energy gradients leads to a condition where flow is driven only

by gravity drainage, and the resulting steady-state water flux can be determined by measuring the unsaturated hydraulic conductivity at that background moisture content. In many sediments, the flux of water that can be transmitted under that condition is very low. While this may be the case at the CFA landfill, data necessary to test that assumption are not available. No measurements of unsaturated hydraulic conductivity have been made for the landfill cover materials nor for the underlying alluvium. In addition, the relatively short monitoring record available is insufficient to reliably identify the depth at which water content would be constant over longer timescales. In this study, lacking that simpler means of estimating long-term average flux, we attempt to estimate the recharge by conducting simulations with a numerical model of the system that has been tuned to reproduce observed behavior.

C-1.2 Objective and Approach

The main objective of this study was to quantify recharge rates through the CFA landfill covers using a numerical model of the infiltration process. This was accomplished by simulating historical infiltration at the site with Hydrus 1D (Simunek, van Genuchten, and Sejna 2005), a one-dimensional unsaturated zone groundwater flow model, and calibrating the model to soil moisture monitoring data. The process requires knowledge of the general geology and climate of the area, details of cover construction, and a suitable data set for model calibration. That information is discussed in Sections C-2 and C-3 of this report.

To use those data to estimate infiltration at different locations within the area of the CFA landfills, researchers constructed model domains representative of the stratigraphy for each location and fed meteorological data-based boundary condition parameters to the models to simulate infiltration, evapotranspiration, and water flow. The model for each location was then calibrated by adjusting soil hydraulic properties so that simulated soil moisture changes matched the observed soil moisture changes that occurred between 2001 and 2003. The results of the calibration were then used to simulate infiltration during the period 1950–2004 and to estimate the effect of hypothetical changes in surface conditions and/or climate.

C-2. SITE CONDITIONS

Infiltration of water into the subsurface and subsequent redistribution of water within the subsurface is controlled by local geology and weather. Pertinent regional and local climatic and geologic conditions are summarized below.

C-2.1 Geologic Conditions

The CFA landfills are located on an alluvial plain near the Big Lost River. The subsurface is a complex sequence of surficial sediments underlain by basalt flows and occasional interbeds. The surficial sediments are gravelly, medium-to-coarse-textured soils resulting from alluvial deposition during past meandering of the Big Lost River. The alluvium ranges from 2 to 73 ft in thickness and is underlain by fractured basalt. Sedimentary interbeds occur infrequently in the sequence of basalt flows and range in thickness from a meter to several meters. The basalt flows continue down to, and through, the aquifer, which is located approximately 140 m below the land surface.

C-2.2 Climatic Conditions

The climate at the Idaho National Laboratory (INL) is that of a semi-arid, high desert region and is characterized by large daily and seasonal temperature variations. During the summer, low humidity, clear skies, and high temperatures result in high potential evaporation rates, while average winter temperatures

remain below freezing for 2 to 3 months, essentially preventing evaporation during the winter. The average annual temperature is approximately 5.5°C and the average annual precipitation is 22 cm yr⁻¹ with 30% falling as snow (Clawson, Start, and Ricks 1989).

Much of the precipitation occurs between fall and late spring, with an occasional thunderstorm occurring during the summer months. Between 1954 and 2003, the highest annual precipitation recorded was 37 cm yr⁻¹ and the lowest recorded precipitation was 11 cm yr⁻¹. Precipitation usually exceeds evaporation from October through May, and evaporation exceeds precipitation during June through September (Clawson, Start, and Ricks 1989).

The average annual potential evaporation from open water is approximately 109 cm yr⁻¹ and exceeds the average precipitation by several times. The highest relative humidity occurs in winter and the average midday value is approximately 55%. The lowest relative humidity occurs in summer and the average midday value is approximately 18%. The prevailing wind direction at the Idaho Nuclear Technology and Engineering Center (INTEC) is southwesterly. The average wind speed at 6 m ranges from 2 m s⁻¹ in December to 4 m s⁻¹ in March and April. Calm conditions exist approximately 11% of the time (DOE-ID 2006).

C-2.3 CFA Landfill Cover Stratigraphy

The native soil cover on the landfills consists of three layers: (a) a general backfill layer that brought the existing grade up to the design slope (rough grade), (b) a compacted low-permeability soil layer (approximately 12 in. thick), and (c) a topsoil layer (approximately 6 in. thick) that created the final grade and allows for growth of a vegetative cover (Figure C-1). Before installation of the cover over each landfill, the landfill was grubbed to remove plants that could decompose and create voids. Fill material for all three layers was obtained from Spreading Area "B" at the INL and placed over the landfills. The fill material was described as lean clay with sand. The general backfill and low-permeability soil layers were compacted to 95% of maximum dry density at 0 to +4 percentage points from optimum moisture content. A detailed description of the installation of the landfill covers is provided in the *Remedial Action Report CFA Landfills I, II, and III Native Soil Cover Project Operable Unit 4-12* (DOE-ID 1997).

C-3. UNSATURATED ZONE MONITORING DATA AT THE CFA LANDFILLS

The overall objective of moisture monitoring at the CFA landfills has been to document the effectiveness of the landfill covers in minimizing infiltration to the landfill wastes. To that end, moisture content monitoring equipment was installed in the landfills during construction of the cover.

C-3.1 Instrumentation

Unsaturated zone infiltration monitoring at the landfills consists of moisture content measurements via five neutron access tubes (NATs) and four vertical arrays of approximately 16 time-domain reflectometers (TDRs) installed in CFA Landfills II and III (Figure C-2).

The NATs LF2-03 and LF2-07 are located on Landfill II, near the edge and center of the landfill, respectively. NAT LF2-04 is located just outside of Landfill II and is used for monitoring moisture content changes under background conditions. NATs LF3-03 and LF3-05 are located on Landfill III. Two vertical TDR arrays, LF2-north and LF2-south are located on Landfill II, near NAT LF2-07. The remaining two vertical TDR arrays, LF3-West and LF3-East are located on Landfill III, near NAT LF3-05.

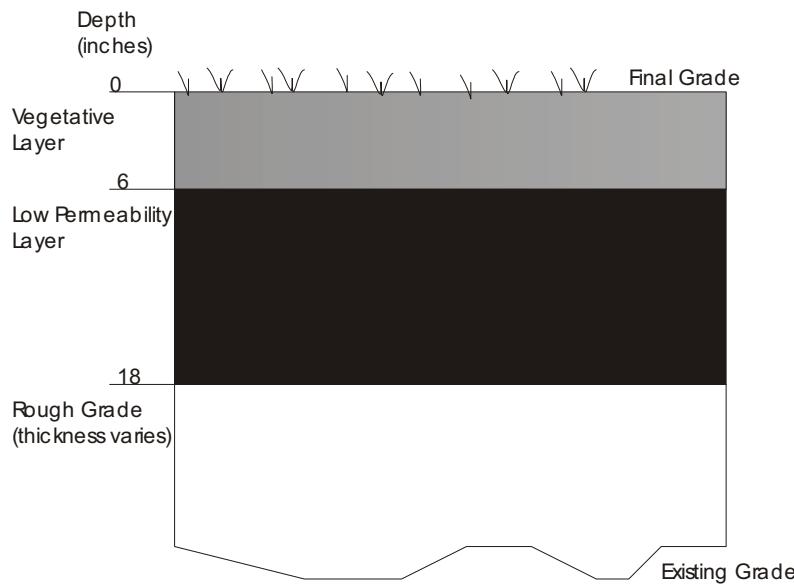


Figure C-1. Approximate schematic of native soil cover construction at the CFA landfills.

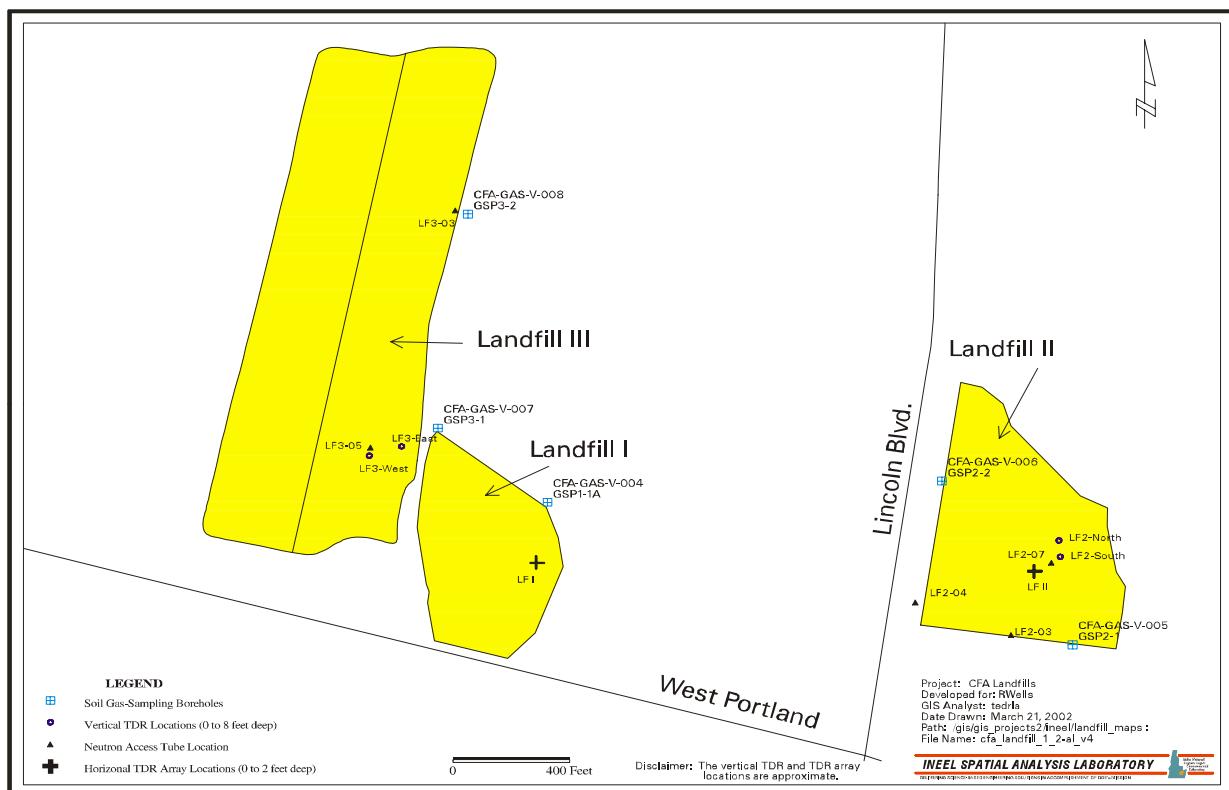


Figure C-2. Locations of time-domain reflectometry arrays and neutron access tubes at the CFA landfills.

C-3.2 Summary of Water Content Variations

Moisture monitoring data from the NATs and TDR arrays at the CFA landfills have been summarized in the annual groundwater monitoring reports. Because this study focuses on infiltration for the current landfill configuration, including current soil cover and vegetation characteristics, we consider here only monitoring data collected after 2001, when the vegetative cover had stabilized and matured. Moisture monitoring data for the period between the fall of 2001 and fall of 2004 demonstrates significantly different behavior between several of the monitoring locations and between different types of monitoring devices at nearby locations (Figure C-3). The moisture content variability versus depth relationship is significantly different between NATs LF3-05, LF2-04, and LF2-07. At LF3-05, moisture content is essentially constant below a depth of 50 cm, while significant changes in water content over time are seen in LF2-04 and LF2-07 to depths of 2 to 3 m. LF2-07 also exhibits high moisture content variability with depth at each observation time, presumably reflecting significant changes in sediment hydraulic properties. While some of the near-surface NAT observations likely have high variability because the sphere of influence for the neutron probe extends above the ground surface, the neutron access tubes have been calibrated to in situ conditions, and calibrated NAT data are generally considered one of the most reliable measures of in situ moisture content. Thus, large differences in the range of depths over which temporal changes in moisture content are observed are presumed to indicate differences in the depth of penetration of seasonal infiltration pulses.

TDR data from the landfills typically show much larger changes in moisture content over time, and significant water content variations typically extend to greater depths. At TDR LF3-West (near NAT LF3-05), for example, the response to seasonal infiltration events (Figure C-4) appears to extend to a depth of 90 cm, and the response at 41 cm is much greater than that at 36 cm in NAT LF3-05 (Figure C-5). Many possible explanations for discrepancies between the NAT and TDR data exist, including (a) the effects of air on the shallow NAT stations, (b) the fact that the TDRs have not been calibrated to the local soils, and (c) the apparent reduction in soil moisture that TDRs register when soil moisture freezes. In general, the fact that the NATs were calibrated to in situ conditions while the TDR instruments were not calibrated suggests that the NAT data should be given precedence in determining actual conditions.

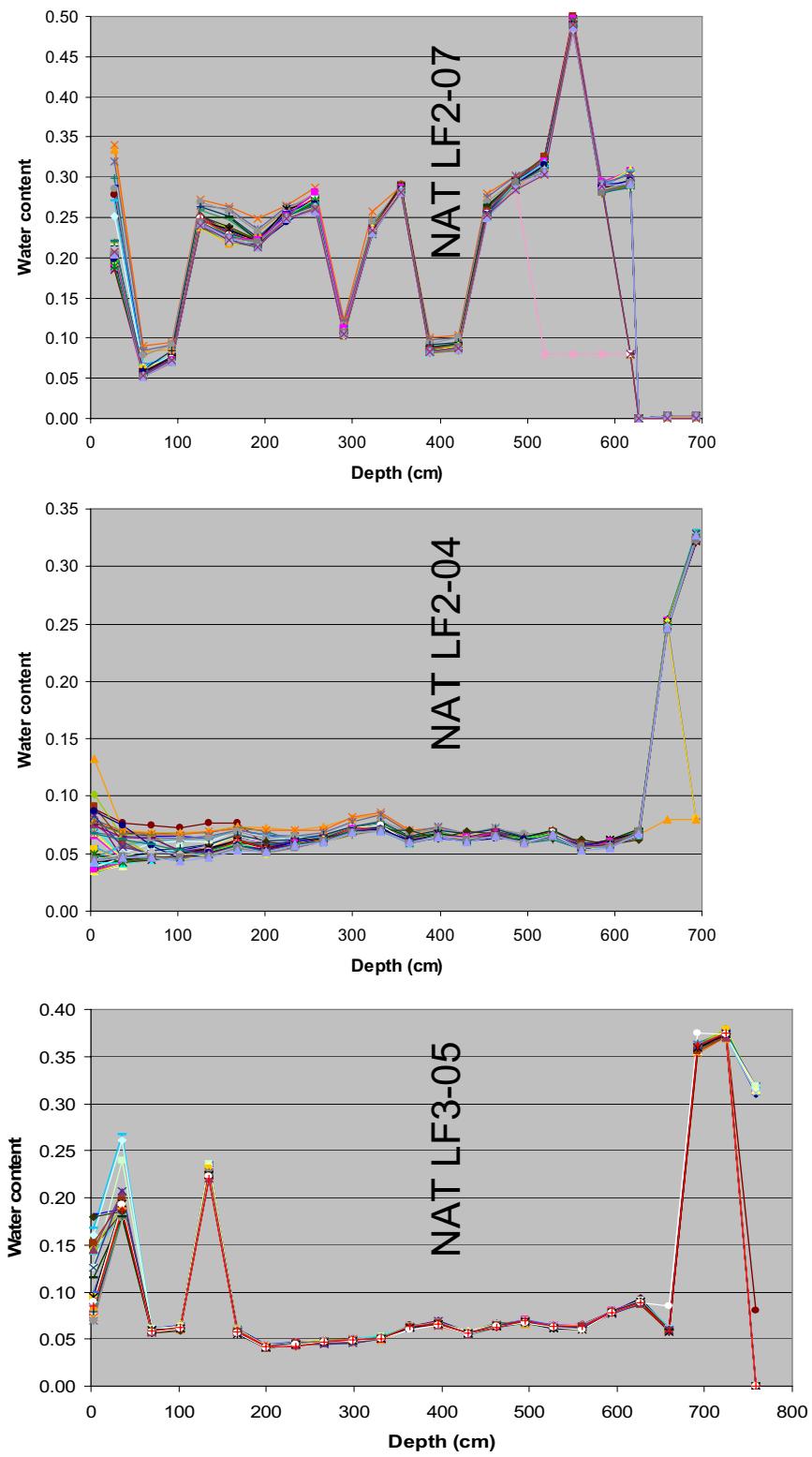


Figure C-3. Neutron access tube moisture content profiles for the period between the fall of 2001 and the fall of 2004. Each curve in each figure represents a different observation, with observations collected approximately monthly.

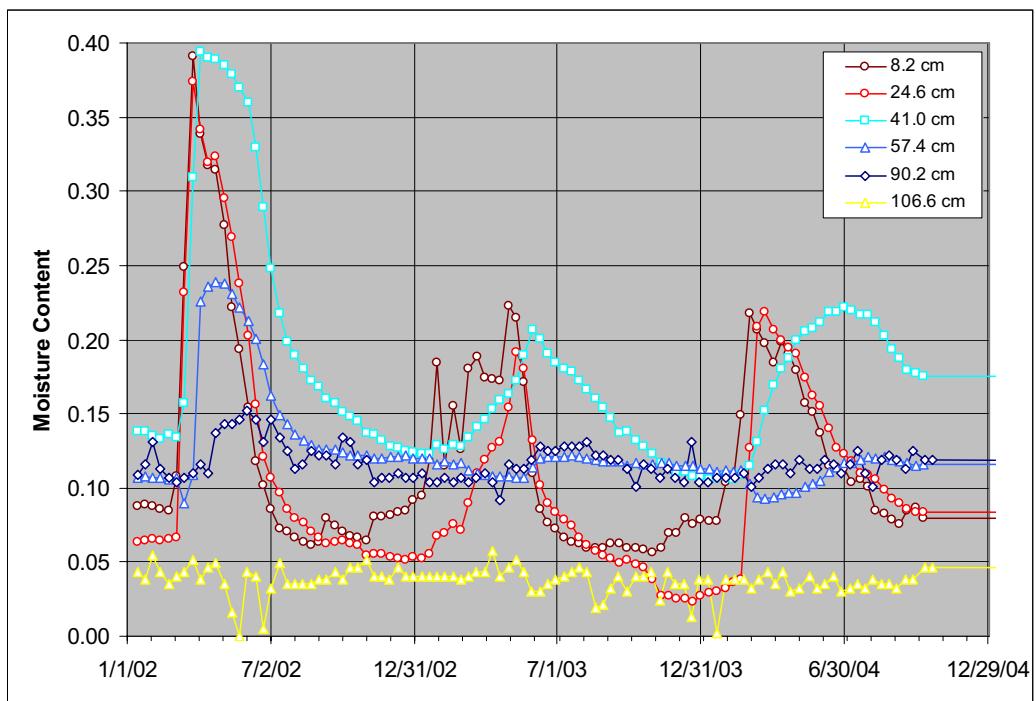


Figure C-4. Moisture content data from TDR LF3-West for the upper ~100 cm of soil for the period between 1/1/2002 and 10/14/2004. Hourly data have been smoothed using a 10-day moving average.

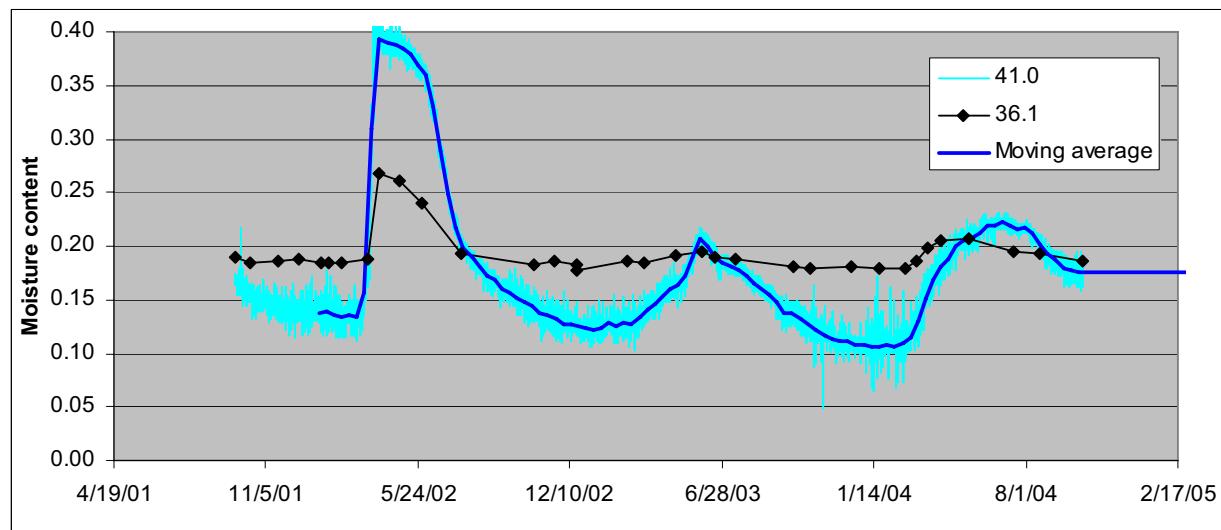


Figure C-5. Comparison of NAT and TDR moisture content data from a depth of ~40 cm for the period between 1/1/2002 and 10/14/2004. Both the hourly and 10-day moving average TDR data are shown.

C-4. NUMERICAL MODELING

Water flow in unsaturated sediments with a time-varying boundary condition is a complex flow problem but one that is amenable to solution by numerical methods. This study used the numerical simulator Hydrus 1D (Simunek, van Genuchten, and Sejna 2005) to solve the unsaturated groundwater flow equations describing the infiltration of water across the soil surface, and through the root zone, including terms for evaporation from the surface and transpirative losses from the root zone. The equations describing these processes are described in the Hydrus 1D user's manual but generally include solution of Richard's equation via the finite element method for a one-dimensional vertical flow domain with distributed parameters, under a wide range of boundary conditions and including source/sink terms. The simulations described in this study incorporate the following features of Hydrus 1D:

- One-dimensional fluid flow, with an upper boundary condition that depends on the soil moisture state of the surface and that varies with water availability and potential evapotranspiration
- Spatially distributed description of soil hydraulic properties, using the van Genuchten and Mualem equations for soil moisture retention and unsaturated hydraulic conductivity (van Genuchten 1980; Mualem 1976)
- Time-dependent upper boundary condition and root-sink term, including
 - Infiltration/evaporation from the soil surface calculated from input of daily precipitation and potential evaporation, and including accumulation of head at the soil surface due to ponding
 - Time-invariant root zone of non-uniform density, with capillary pressure-dependent transpiration (Feddes [1978] model) calculated from input of daily transpiration potential
- Free-drainage condition at the lower boundary
- Automated inverse estimation of van Genuchten hydraulic properties by non-linear least squares fitting to observed water content histories.

C-4.1 Model Inputs

The initial goal of the predictive modeling process is to develop a model of the system that reproduces the system's behavior reasonably well, using processes and parameters considered representative of the system. Having accomplished that task, the model can be used to examine how the simulated system might behave under other conditions. Thus, this study first seeks to reproduce the observed changes in soil moisture content at different depths using a model that reflects the actual meteorological conditions as well as the actual distribution of soil types in the profile, plant types and their phenology, and root distribution. Details of the models constructed to simulate moisture infiltration and redistribution at the CFA landfills are presented here.

C-4.1.1 Water Input to the Soil Surface

Water input to the soil surface in the climate of southeastern Idaho includes snowmelt as well as precipitation. Therefore, precipitation must be partitioned into a snow fraction and a rain fraction. Additionally, accumulation and melt of the seasonal snowpack must be added to or subtracted from the raw daily precipitation data. In this study, average daily temperature was used to determine whether precipitation fell as rain or snow, using a critical temperature T_c , to determine the timing of onset and end

of the accumulation period, with T_c set at the melting point. To account for the fact that the snowmelt infiltration season typically begins only after temperatures have been above zero long enough to melt subsurface frost as well as snow and warm the soil to the melting point, this study used an 11-point median smoothing function to dictate timing of onset and end of the snow accumulation season. When snowmelt begins, the daily snowpack depletion (and added surface water input) is calculated using a degree-day melt method, assuming a daily melt rate factor of $0.274 \text{ cm day}^{-1} \text{ }^{\circ}\text{C}^{-1}$. That value is consistent with the value from Mockus (1972) used in previous infiltration studies at the INL (Magnuson 1993; DOE-ID 2006) and—according to equations reported by Rango and Martinec (1995)—is representative of melting in an unforested area with average snowpack density of $\sim 260 \text{ kg m}^{-3}$.

C-4.1.2 Potential Evaporation and Potential Transpiration

Daily values of potential evaporation (PE) and potential transpiration (PT) were calculated from a calculated daily reference evapotranspiration, PET. Previous infiltration studies at the INL have been conducted using the UNSAT-H model, which internally partitions PET into PT and PE. To maintain consistency with those previous studies but take advantage of the automated inverse modeling capabilities of Hydrus 1D, PET was calculated as performed in UNSAT-H V3, with the form of the Penman equation reported by Doorenbos and Pruitt (1977) and using, wherever possible, the same parameters incorporated in the previous INL infiltration modeling studies. The PET calculations use the same meteorological data used by Martian (DOE-ID 2006) and Magnuson (1993), the origin of which is described in detail in Magnuson (1993). Full details of the calculations are included in the annotated Mathcad worksheets in Appendix C-A.

The PET was partitioned into PT and PE based on the approach described in Magnuson (1993), which attempts to replicate transpiration by crested wheatgrass in the climate of southeastern Idaho. Though wheatgrass roots can extend to a depth of at least 1 m (Reynolds and Fraley 1989), the root zone was limited to the vegetation layer in this study, based primarily on preliminary modeling studies that suggested greater infiltration than expected for a deeply rooted system. The fixed root zone extended from 0 to 15 cm, with density linearly increasing away from a maximum density at 5 cm.

The water-use cycle for crested wheatgrass, which essentially reflects the plant's phenology, was developed based on information presented by Anderson, Shumar, and Toft (1987) and on leaf length growth data presented in Ansley and McKell (1982). The growing season is assumed to begin on March 20 and end on July 15 (Magnuson 1993). Potential transpiration, following seasonal changes in leaf length, increases from zero at the beginning of the growing season, reaches a plateau at the end of May, and then begins to linearly decrease toward zero at the end of June. Transpiration rate depends on a difficult-to-define relationship between biomass and water use. To maintain consistency with previous infiltration studies at INL, and lacking contradictory data, this study used the maximum transpiration to PET ratio discussed in Fayer (2000), which is based on an empirical study of cheatgrass at the Hanford Site. This gives a maximum PT to PET ratio of 0.3. The seasonal changes in that ratio of PT to PET, which were used to calculate PT, are shown in Figure C-6a. The fraction of PET partitioned to PT was then subtracted from calculated PET to yield PE. Resulting values for PET, PT, and PE for the year 2002 are shown in Figure C-7. Calculated PET values compare well to pan evaporation data from the Aberdeen Experimental Station in southeastern Idaho (Table C-1) (Oregon Climate Service).

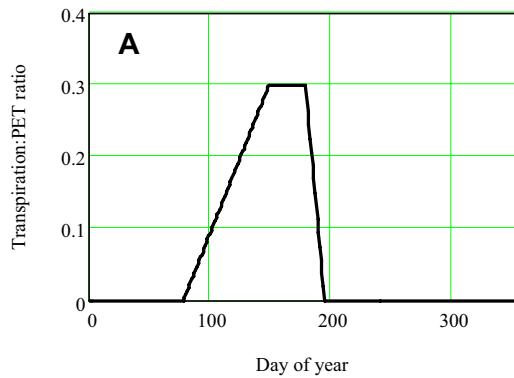


Figure C-6a. The seasonal cycle of potential transpiration relative to reference evapotranspiration used in simulations, designed to represent wheatgrass water use in the climate of southeastern Idaho.

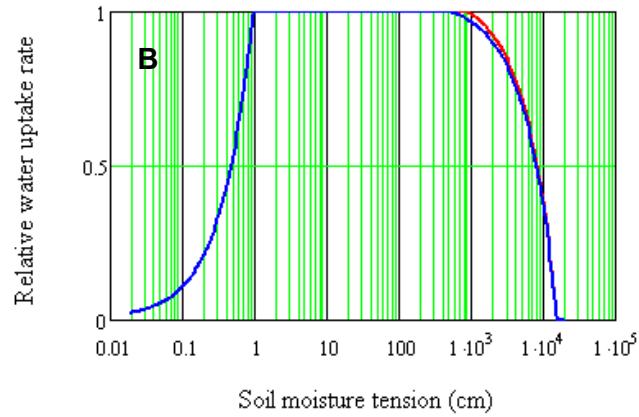


Figure C-6b. The soil moisture stress response function for transpiration used in the models, with water uptake rate normalized to its maximum value (plateau in Figure C-6a).

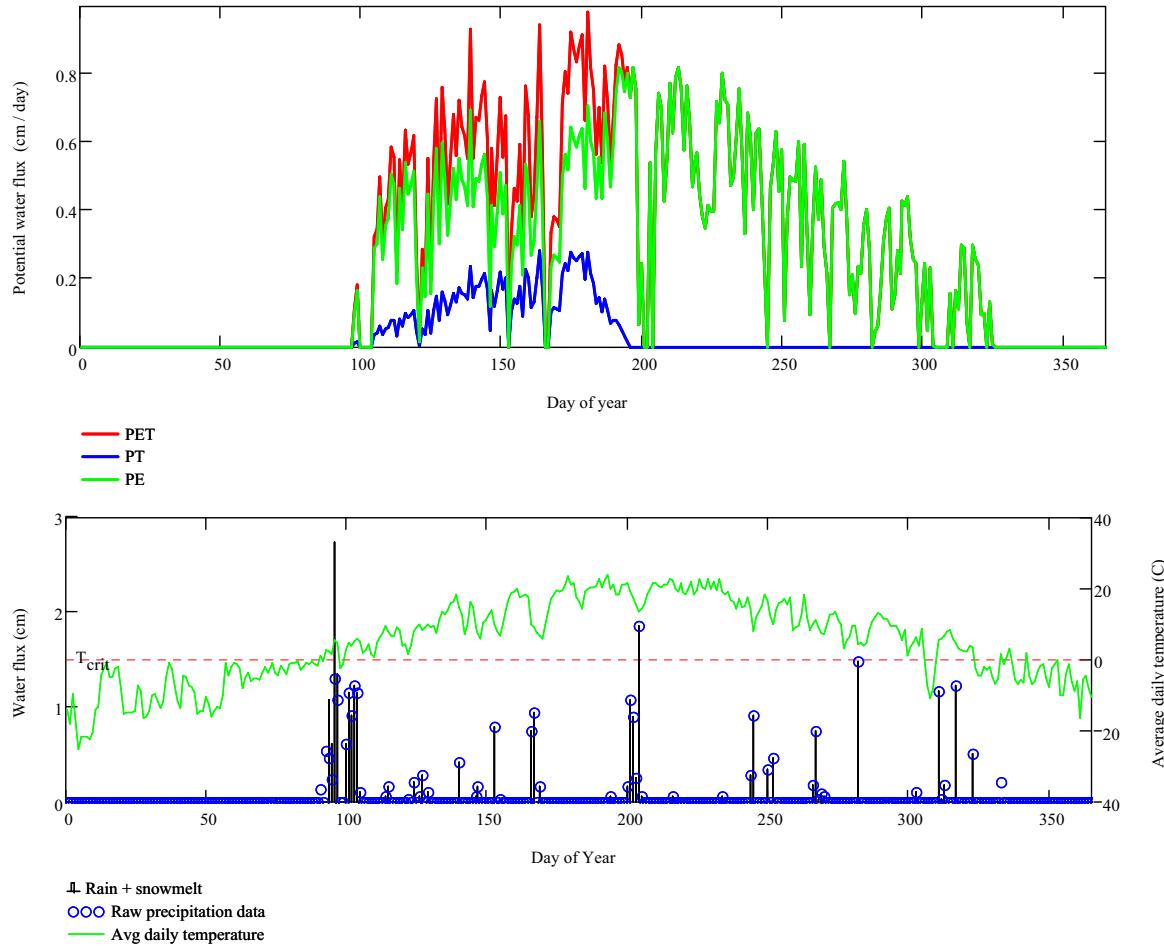


Figure C-7. Relevant meteorological and derivative parameters for 2002. Upper plot shows potential evapotranspiration, potential evaporation, and potential transpiration (annual totals are 131, 117 and 14, respectively). Lower plot shows raw, daily precipitation data (annual total = 14.6 cm), calculated rain plus snowmelt (annual total = 14.7 cm), and daily mean temperature.

Table C-1. Pan evaporation (cm) at the Aberdeen Experimental Station.

Aberdeen Exp Stn (1914–2002)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Monthly evaporation (cm)	—	—	—	—	19.1	22.7	26.2	23.9	16.3	9.8	—	—	118.0
Avg daily evaporation (cm)	—	—	—	—	0.62	0.76	0.85	0.77	0.54	0.32	—	—	—

Data source: (http://www.ocs.oregonstate.edu/page_links/comparative_climate/idaho/idaho.html).

Variable upper boundary condition data in the Hydrus 1D program require PT, PE, and a minimum allowed pressure head at the soil surface. The latter was assigned a value of 500,000 cm, which is lower than a typical value for the lower limit of plant available water in soil but not as low as the air dry pressure that can be readily obtained in desert environments. Hydrus 1D internally calculates a relationship between capillary pressure and transpiration. In this study, we used the options in Hydrus that describe that relationship according to the method of Feddes et al. (1978). Values of the parameters used in simulations for this study were based on values data for wheat provided in Hydrus 1D (see Table C-2). The resulting plant stress response function defining total transpiration potential relative to maximum transpiration potential is shown in Figure C-6b.

Table C-2. Parameters used to implement the Feddes equations describing the relationship between root water uptake potential and soil moisture tension. Pressures (P terms) given in cm, transpiration rate limits (r_{2H} , r_{2L}) given in cm/day.

Feddes' Parameters

P0	0
POpt	-1
P2H	-500
P2L	-900
P3	-16000
r2H	0.5
r2L	0.1

C-4.1.3 Stratigraphy and Sediment Hydraulic Properties

Accurate interpretation of changes in soil moisture storage, in terms of net infiltration, net root-water uptake, and net recharge requires accurate knowledge of the relationship between water content and hydraulic conductivity. The CFA landfills consist primarily of two sediment types, (1) the native alluvium that underlies the landfill and that forms the first layer of cover material and (2) Spreading Area B (SAB) sediments that were used to (a) bring the landfills to grade, (b) construct a compacted low-permeability layer, and (c) provide the vegetation layer that forms the current surface. Numerous measurements of important hydraulic properties, including measurements of saturated hydraulic conductivity and estimates of the van Genuchten soil moisture retention curve parameters have been obtained on both of these sediments; these data are summarized in Table C-3 and Figure C-8.

Table C-3. Mean values and ranges of selected hydraulic parameters. Except for K_{sat} , min, max, and mean refer to combinations of parameters that provide minimum values of “observed” water content data at a range of pressures, not to statistics on individual parameters. K_{sat} means are geometric means or means of assumed log-normal distributions.

	Number of Samples	Water content curve	K_s^\dagger (cm s^{-1})	θ_r^\ddagger	θ_s^\ddagger	α^\ddagger (cm^{-1})	n^\ddagger
Column study	4	Mean	2.8e-05	0.007	0.5	0.009	1.25
		Min	1.4e-05	0.006	0.44	0.004	1.22
		Max	4.1e-05	0.06	0.53	0.013	1.37
EBTF study	39	Mean	6.9e-05	0.04	0.48	0.03	1.19
		Min	3.5e-06	0.008	0.43	0.03	1.20
		Max	3.6e-04	0.111	0.51	0.04	1.24
INTEC alluvium	17	Mean	9.7e-03	0.028	0.33	0.299	1.20
		Min	6.7e-08	0.028	0.31	0.311	1.30
		Max	1.0e-01	0.028	0.36	0.28	1.17

EBTF = Experimental Barrier Testing Facility; data from Porro and Keck (1998).
 INTEC = Idaho Nuclear Technology and Engineering Center; data from DOE-ID (2006).

† Of log-transformed values

‡Mean, maximum, and minimum values for each parameter were calculated from van Genuchten parameters tabulated in previous studies. Mean value parameters yield a curve that provides the mean water content value for the range of sample values at each capillary pressure. Maximum and minimum values for each parameter define curves that describe the upper and lower limits of envelope surrounding the predicted water content values from each set of parameters. Calculations are summarized in Appendix C-B.

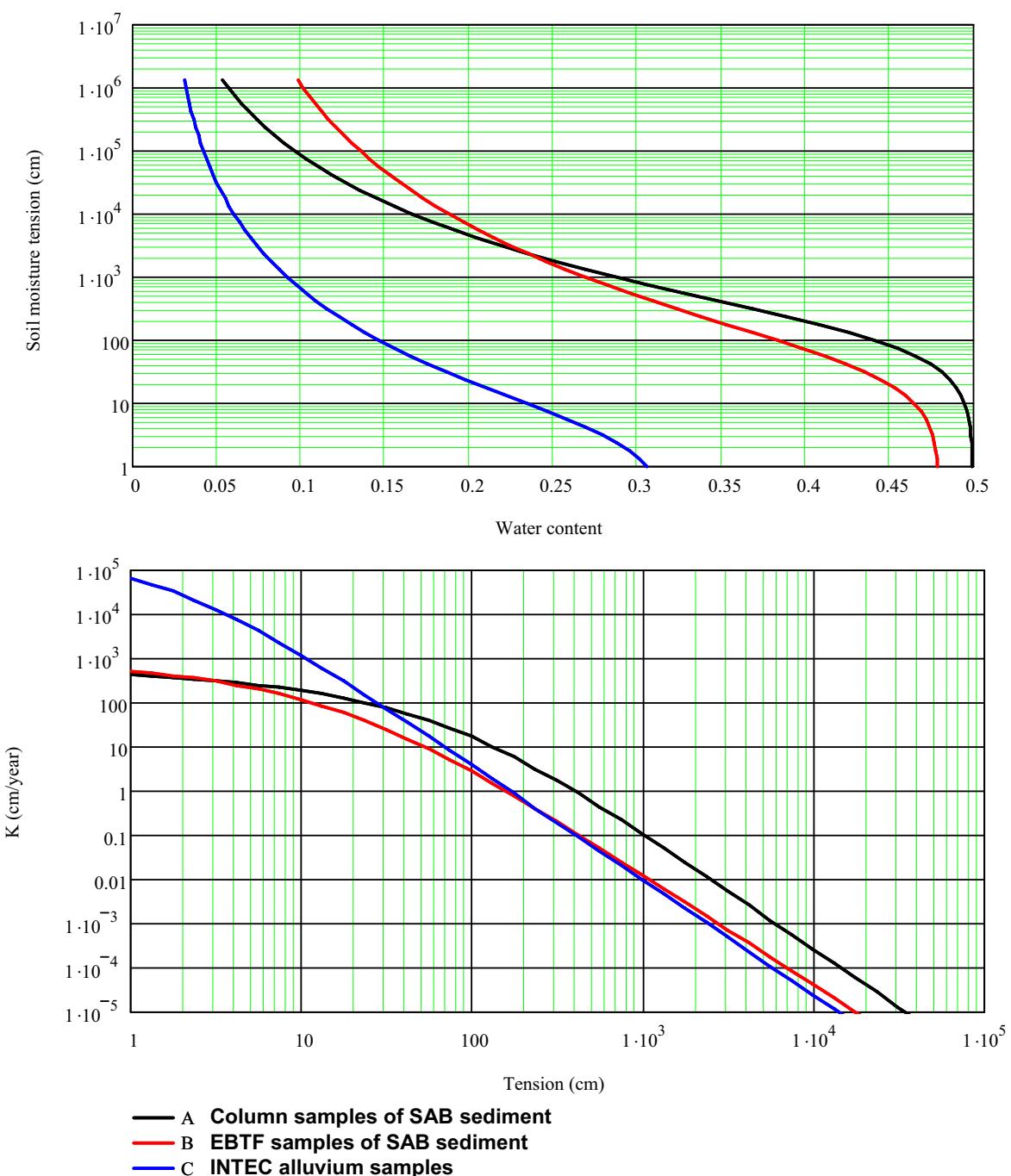


Figure C-8. Calculated average retention curves and unsaturated hydraulic conductivity curves for two sets of samples of Spreading Area B sediments and for one set of samples of alluvium. Parameters were calculated as described for Table C-3.

For this study, inverse modeling studies were conducted for NAT data from stations LF3-05, LF2-04, and LF2-07. Hydrostratigraphic units for each of these locations were chosen based on a combination of construction details and analysis of the moisture content variations at each location. Where slow infiltration progresses through a uniform sediment, moisture content variation generally decreases with depth while average moisture content remains approximately the same. Significant deviations from that behavior generally suggest changes in the moisture retention behavior. Where moisture content is relatively constant, matching such spatial variations does little to constrain infiltration processes. The inverse modeling process thus focuses more on matching observed temporal trends in water content than on matching spatial variations in moisture content. To that end, a minimal number of hydrostratigraphic units were used for each station. In each model, the simulation domain extended from the surface to a depth of 180 cm, sufficient to extend beyond the influence of the root zone. For stations LF3-05 and LF2-07, installed in the landfills, three different material types were used to represent (a) compacted SAB sediments, (b) uncompacted SAB sediments (above and/or below the compacted layer), and (c) the underlying native sand and gravel (Figure C-9). For LF2-04, installed in native conditions that typically consist of a thin layer of loess overlying sand and gravel, only two material types were used. In each model, a fixed root zone extended from 0 to 15 cm, with density linearly increasing from away from a maximum density at 5 cm.

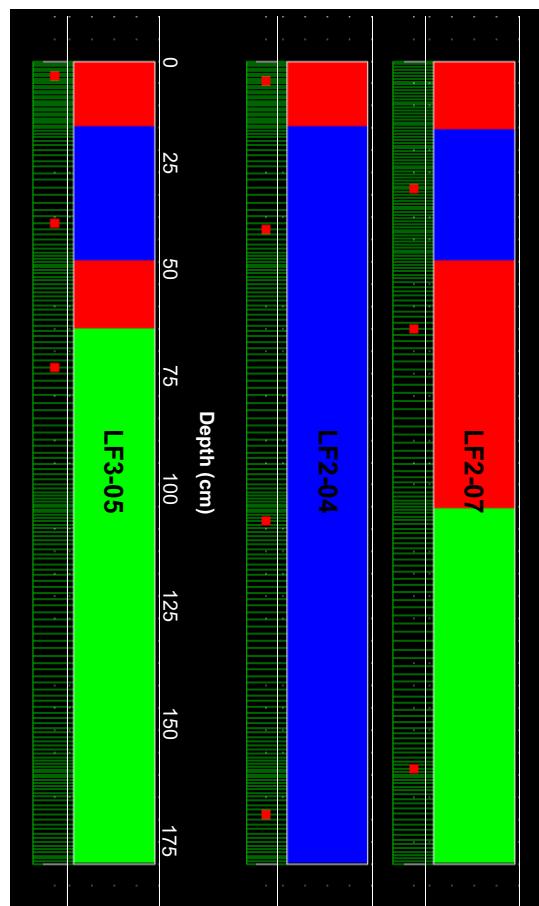


Figure C-9. Material distributions for the three simulated NAT stations. Colors represent different materials used in each model. Red symbols adjacent to material property columns show locations of observation nodes; green lines depict model node distribution.

C-4.2 Calibration Data Sets

For each of the simulated sediment profiles, a subset of the available NAT data was selected as a target for the calibration target. Calibration target series for each model (Figure C-10) were selected to reflect (1) the largest reliably measured changes in moisture content occurring near the surface and (2) the decrease in response with depth. At Station LF3-05, only two calibration targets were used because data from the 3-cm station were considered unreliable and the moisture content was essentially invariant for the selected calibration interval, which was below 36 cm. At LF2-04, the 2001 and 2002 infiltration pulses appeared to extend to a depth of several meters with essentially no time lag. Thus, three calibration target depths were selected for observations near the top, middle, and bottom of the 180-cm simulation domain. Similar behavior was observed at LF2-07, where calibration targets were similarly selected.

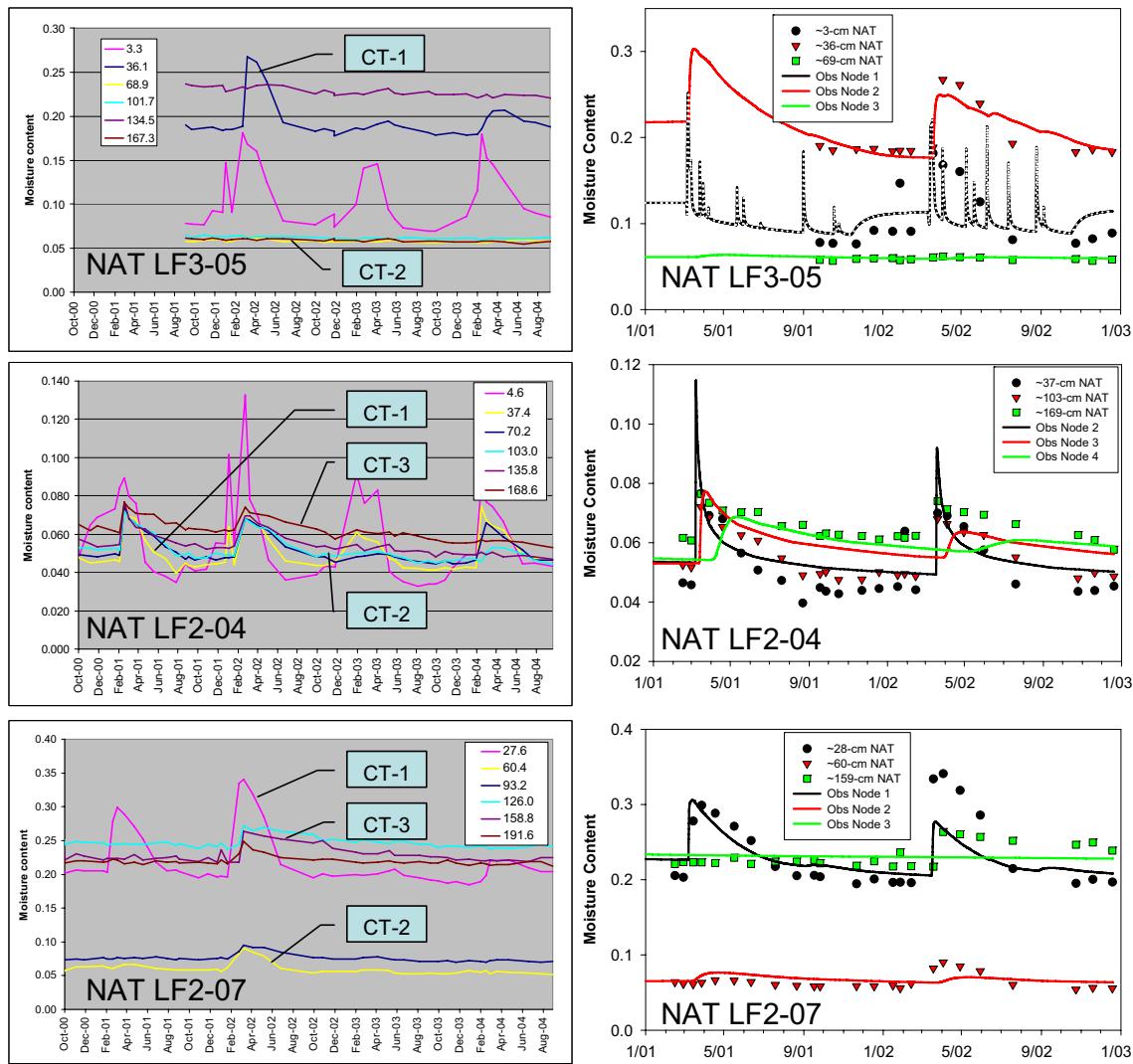


Figure C-10. Plots at left show NAT-recorded moisture content variations to a depth of approximately 2 m in the NAT stations modeled in this study. Labels indicate calibration target data series (CTs) used. Plots at right compare simulated moisture content changes (curves) to selected calibration target data series (symbols). Note that the plot for LF3-05 shows comparison to data from the 3-cm point, which was not used as a calibration target.

C-4.3 Simulation Period

Calibration simulations were each run for the period from January 1, 1995, to December 31, 2003, with calibration data generally starting in late 2001. The 6-year period preceding the time period used for calibration allows the model to come into equilibrium with the climatic regime, thereby erasing the influence of the initial conditions. Previous studies (DOE-ID 2006) indicate that three years probably is sufficient to remove the influence of initial conditions. The simulation results presented here support that conclusion, with little change in average moisture conditions or fluxes occurring after the first 2 years of each simulation.

Soil moisture retention and unsaturated hydraulic conductivity relationships were described using the van Genuchten and van Genuchten – Mualem equations in all simulations. This requires five parameters: (1) the alpha parameter, which is inversely proportional to air entry potential; (2) the n parameter, which is related to the pore size distribution; (3) the porosity; (4) the residual water content and (5) saturated hydraulic conductivity. For each inverse simulation, for each layer, between two and five of these parameters were allowed to vary to improve the match between simulated and observed moisture content. The number of fitted parameters varied in part because too much freedom sometimes produced unstable models that would terminate because of numerical convergence problems. Table C-4 indicates which values were fitted for each layer.

Table C-4. Comparison of inversed soil hydraulic parameters to parameters estimated from measurements of soil moisture retention behavior in multiple samples of Spreading Area B sediment (column study samples and EBTF samples) and of INTEC alluvium samples.

	Number of Samples	Water Content Curve	K_s^\dagger (cm s ⁻¹)	θ_r^\ddagger	θ_s^\ddagger	α^\ddagger (cm ⁻¹)	n ^{\ddagger}
Column study	4	Mean	2.8e-05	0.007	0.5	0.009	1.25
		Min	1.4e-05	0.006	0.44	0.004	1.22
		Max	4.1e-05	0.06	0.53	0.013	1.37
EBTF study	39	Mean	6.9e-05	0.04	0.48	0.03	1.19
		Min	3.5e-06	0.008	0.43	0.03	1.20
		Max	3.6e-04	0.111	0.51	0.04	1.24
INTEC alluvium	17	Mean	9.7e-03	0.028	0.33	0.299	1.20
		Min	6.7e-08	0.028	0.31	0.311	1.30
		Max	1.0e-01	0.028	0.36	0.28	1.17
Inversed parameters NAT LF3-05	Material 1		5.4e-03	0.01	0.53	0.006	1.30
	Material 2		1.8e-07	0.03	0.53	0.0001	1.96
	Material 3		5.8e-03	0.01	0.34	0.024	1.30
Inversed parameters NAT LF2-04	Material 1		2.7e-03	0.05	0.4	0.12	1.50
	Material 2		1.2e-02	0.04	0.3	0.15	1.89
Inversed parameters NAT LF2-07	Material 1		1.5e-05	0.01	0.35	0.0033	1.76
	Material 2		1.2e-05	0.01	0.53	0.001	1.77
	Material 3		5.8e-04	0.03	0.50	0.0013	1.50
EBTF inversed parameters	SAB sediment		1.08e-05	0.015	0.47	0.0021	2.09
EBTF = Experimental Barrier Testing Facility; data from Porro and Keck (1998). INTEC = Idaho Nuclear Technology and Engineering Center; data from DOE-ID (2006). NAT = neutron-probe access tube							

C-4.4 Results

C-4.4.1 Matching Observed Water Content Histories through Inverse Modeling

The relative match of simulated moisture content variations to observations was somewhat variable between stations; the best fit to observations was obtained at LF3-05 and the behavior at LF2-07 was reproduced most poorly. In some cases where a good fit to observations was obtained, the fitted saturated hydraulic conductivity, K_{sat} , was quite different than the value expected based on measurements of that parameter from multiple soil samples. Differences between other fitted parameters and expected values were generally considered of less significance. Fitted saturated and residual moisture contents were close to expected values because those parameters were constrained to remain close to values obtained from moisture retention studies. Alpha and n parameters derived from moisture retention curve data, on the other hand, are less reliable predictors of the shape of the unsaturated conductivity versus moisture content curve (reference), and deviations from those values, particularly for coarser soils, should be expected, as the inverse simulations are primarily attempting to reproduce the unsaturated conductivity function.

At LF3-05, a relatively good fit was achieved between observed and simulated moisture content at the two target depths and at a near-surface location not used for calibration (Figure C-10). However, a certain number of the inversed soil hydraulic properties deviated significantly from available indicators of those values. Most significantly, the inversed K_{sat} for the vegetation layer, comprised of SAB sediment is an order of magnitude larger than the highest measured value of 43 measurements of samples of that material (Table C-4). Conversely, the inversed K_{sat} for the low permeability layer (Material 2) was approximately two orders of magnitude lower than the mean of measured values for the SAB sediment from which it was constructed, and the inversed K_{sat} for the underlying alluvial material was close to the mean of multiple measurements (DOE-ID 2006) of similar material at the INTEC facility. The lower conductivity for the compacted (to 95% of maximum dry density) sediment layer is expected because the measurements were made on uncompacted sediment. A possible explanation for the discrepancy in the vegetation layer is that the observed cracks forming in that layer have significantly increased its conductivity.

Moisture content variations at NAT LF2-04 show a general damping with depth and relatively constant average moisture content that is characteristic of slow downward flux through a section of relatively uniform sediment. For that reason, only two material types were used in modeling the section, and calibration simulations reproduced that behavior quite well (Table C-4). Downward redistribution of infiltration, however, usually results in a lag between infiltration event and response that increases with depth, as increases in moisture content at any depth reflect a temporary inability to transmit the flux from above. Observations at this location show virtually no lag, and response over more than 2 m depth appears to happen simultaneously, although some amount of lagged response could be hidden by the relatively infrequent sampling pattern. This behavior was difficult to reproduce in simulations, and the comparison displayed in Figure C-10 shows that while the general magnitude of temporal variations at each depth is reproduced reasonably well, the simulation shows much greater lag (near the bottom of the profile). Given the great depth over which infiltration pulses extend at LF2-04, and the rapidity at which that signal propagates (compared to simulation results), it is possible that preferential flow is occurring along the NAT installation.

Similar to results for Station LF3-05, comparison of fitted hydraulic parameters for LF2-04 with values predicted from soil moisture retention studies shows higher fitted hydraulic conductivity for the vegetation layer than expected (Table C-4). Again, this may be related to an increase in overall conductivity due to the development of cracks penetrating the vegetation layer.

Calibration simulations at NAT LF2-07 reproduced reasonably well the behavior of the 28-cm and 60-cm observation points, in the low-permeability layer, and underlying SAB sediment, but they could not capture the shape of the 2002 wetting pulse at 159 cm, which was as large as, and sharper than, that at 60 cm (Table C-4). This is, in part, because the simulated climate produces a smaller infiltration pulse in 2002 than in 2001; whereas the NAT data consistently show the opposite behavior.

C-4.4.2 Cumulative Fluxes of Calibrated Models

Following calibration, soil hydraulic parameters estimated from the inverse method were used to simulate infiltration and redistribution at each of the calibration stations for the period between 1950 and 2004, again using available water for infiltration and potential transpiration and potential evaporation records calculated from local meteorological data. The cumulative flux into the soil profile (infiltration), out of the root zone (transpiration), and penetrating the bottom of the profile (recharge) for each of these simulations are shown in Figure C-11.

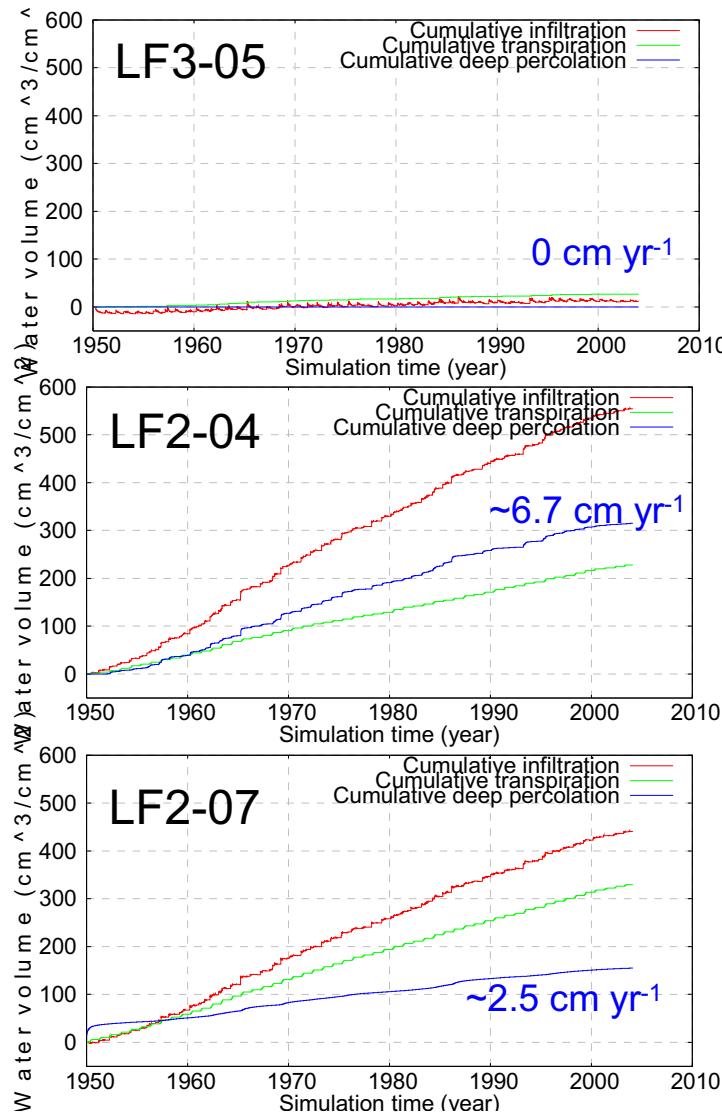


Figure C-11. Cumulative infiltration (downward flux across the soil surface), cumulative transpiration, and cumulative recharge (downward flux through bottom of profile) for ~55-year simulations using soil hydraulic parameters estimated from the inverse calibration simulations. First ~2 years in each simulation show effects of initial conditions. Values shown are average recharge rates for the 1960–2000 period.

At LF3-05, where water content variations were most rapidly damped with depth, seasonal infiltration pulses were effectively removed by subsequent evaporation. Net infiltration across the upper boundary was thus nearly negligible and transpiration removed the small flux that did penetrate the surface. Thus, recharge was effectively zero. The potential for complete evapotranspirative removal of infiltrated water is supported by recent chloride mass balance studies at the INL^b, which indicate that recharge in undisturbed, naturally vegetated areas is on the order of a fraction of a millimeter per year.

Calculated average fluxes at LF2-04 and LF2-07 were approximately 7 and 3 cm per year, respectively, with much greater net infiltration and transpiration occurring in each (LF2-04 and LF2-07) than at LF3-05. These higher fluxes are primarily the result of attempts to reproduce significant response to infiltration events at depths below the root zone, where fluxes are redistributed temporally rather than removed by transpiration. Notably, the simulated recharge at LF2-07 is less than that at LF2-04 (located between the landfills), suggesting that the cover on Landfill II significantly enhances evapotranspiration over natural conditions. This suggestion seems reasonable, given that storage in the landfill covers should be increased significantly by the thickness of high-porosity SAB sediment used in both the vegetation and low-permeability layers of the cover. However, as neither of the calibration simulations at LF2-04 and LF2-07 adequately captured the magnitude of the response at depth, actual fluxes at those locations may be higher than represented in the simulations, possibly because of preferential flow effects associated with the structure of the cover itself or with the presence of the instrumentation.

C-5. SUMMARY AND RECOMMENDATIONS

Simulated moisture content changes at LF3-05 compare well to NAT-based moisture content changes, and data and modeling at that location indicate that little if any infiltration penetrates below the lower permeability layer of the landfill cover. This is consistent with chloride mass balance studies at the INL Site, which suggest that evapotranspiration effectively removes all but a fraction of a millimeter of annual precipitation under natural conditions.

Data from NATs LF2-04 and LF2-07, and simulation studies of those data, yield more tenuous conclusions about long-term recharge through Landfill II, because the data appear to be significantly influenced by preferential flow, which may be representative of landfill cover structure but also may be an artifact of the presence of the neutron access tubes. If the latter is true, the actual fluxes through the covers may be much smaller. If the former is true, the actual fluxes may vary significantly with location on the landfill.

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